

I

URBAN DISTRICT OF NORTHFLEET



CERTAIN MATTERS
CONCERNING
PUBLIC HEALTH
1967 - 1969

(PART 3)

SANITARY
CIRCUMSTANCES

URBAN DISTRICT OF NORTHFLEET

Report for the years 1967-69 on certain
matters concerning Public Health

PART 3

The duties to which this report contributes were outlined in the introduction in Part 1. The report is being produced in four parts:

- 1 VITAL STATISTICS
- 2 STATISTICS OF COMMUNICABLE DISEASE
- 3 SANITARY CIRCUMSTANCES
- 4 COMMENTARY AND SUMMARY

I am submitting each part to the Council as it is completed. Parts 1 and 2 have already been submitted. Part 3 I submit herewith.

J. H. Hudson

J. H. HUDSON,

MEDICAL OFFICER OF HEALTH

October, 1972

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TABLE XXXV SHARED DWELLINGS 1961 CENSUS

Derived from Tables 11 and 13 of Kent Report and
correspondence with the Registrar General.

	Dartford Town *	Dartford R.R.D.*	Northfleet U.D.	Swanscombe U.D.
(a) Existing dwellings shared:				
(i) dwellings with: two households	127	51	64	19
three "	11	4	9	2
(ii) Households with: two families	297	441	171	54
three "	<u>33</u>	<u>49</u>	<u>19</u>	<u>6</u>
∴ Dwellings shared assuming (i) does not include (ii)	468	545	263	81
(b) Total dwellings required where:				
dwellings have: two households	254	102	128	38
three "	33	12	27	6
households have: two families	594	882	342	108
three "	<u>99</u>	<u>147</u>	<u>57</u>	<u>18</u>
∴ Additional dwellings required to end sharing and provide one dwelling for each of all families i.e. (b)-(a)	980	1,143	554	170
	512	598	291	89
Population 1961	43,460	51,260	22,380	8,910
Rate per 10,000 population	118	117	130	100

* Denotes each district population less 2000 in long stay hospitals

TABLE XXXVI COUNCIL DWELLINGS BUILT 1953 - 1969

	per 10,000 1953 population	as percentage of all dwellings built
*Dartford Town	514 ‰	51%
*Dartford Residential Rural District	703 ‰	23%
Northfleet Urban District	847 ‰	45%
Swanscombe Urban District	734 ‰	60%

Table x x x v 11

Housing Provision in the 17 years 1953-1969

Local Authority	Popu- lation mid 1953	Popu- lation mid 1970	17 years Population increase			Dwellings built 1953-69					Dwellings put out of use for habitation					Increase in dwellings available		Increase in population mid 1953-mid 1970 per 100 additional dwellings available		
			Total mid 1953= mid 1970	Natural 1953-1969	Migration	Built	Boundary change 1957	Private enterprise	Boundary change 1957	Total	Unfit and demolished	Purchased by L.A. for re- development	Hutments demolished	Prefabricated bungalows demolished	Total	Number	Per 10,000 1953 popu- lation	Natural	Migration	Total
Dartford Town	38430	44260	5830	5478	+352	1611	+486	1909	+1	4007	397	about 20	0	6	423	3584	935	153	+10	163
Dartford Residential Rural District	36610	63000	26390	8880	17510	2933 (367 by Borough)	-486	7524	-1	9970	306	about 30	16	71	423	9547	2610	93	+184	277
Northfleet Urban District	19280	25600	6320	3493	2827	1636	-	2010	-	3646	204	271	3	0	478	3142	1630	111	+90	201
Swanscombe Urban District	8614	9430	816	1067	-251	633	-	417	-	1050	75	8	38	100	221	829	960	129	-30	99
Cols.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

Dartford Town = Borough less 2000 persons in institutions
Dartford Residential Rural area = District " " " " " "

XXXXXX
TABLE ~~XXI~~ IMPROVEMENT GRANTS

RATES PER THOUSAND HOUSES WITHOUT FIXED BATH AT 1961 CENSUS
cumulative

Year	Standard grants	o/oo Houses no bath	Expend. £000	o/oo Houses no bath	Discret. grants	o/oo Houses no bath	Expend. £000	o/oo Houses no bath
<u>Dartford R.D.</u>								
1961	32	13 ⁰ /oo	3	1.2 ⁰ /oo	160	63 ⁰ /oo	36	14.2 ⁰ /oo
1962	74	29 ⁰ /oo	8	3.1 "	227	89 "	41	16.1 "
1963	122	48 ⁰ /oo	15	5.9 "	227	89 "	41	16.1 "
1964	180	71 ⁰ /oo	22	8.6 "	229	90 "	41	16.1 "
1965	257	101 ⁰ /oo	31	12.3 "	242	95 "	43	16.9 "
1966	304	119 ⁰ /oo	42	16.5 "	243	95 "	44	17.5 "
1967	378	148 ⁰ /oo	57	22.4 "	243	95 "	44	17.5 "
1968	460	181 ⁰ /oo	75	29.4 "	243	95 "	44	17.5 "
1969	557	219 ⁰ /oo	96	37.7 "	245	96 "	45	17.7 "
1970	600	236 ⁰ /oo	107	42.0 "	246	97 "	45	17.7 "
1971	666	262 ⁰ /oo	124	47.9 "	278	109 "	63	24.7 "

Dartford M.B.

1961	25	14 ⁰ /oo	2	1.1 ⁰ /oo	82	46 ⁰ /oo	15	8.4 ⁰ /oo
1962	43	24 "	4	2.2 "	100	56 "	19	10.6 "
1963	59	33 "	6	3.4 "	121	68 "	24	13.4 "
1964	85	48 "	9	5.0 "	143	80 "	30	16.8 "
1965	106	59 "	11	6.2 "	164	91 "	38	21.3 "
1966	123	69 "	14	7.8 "	179	100 "	42	23.5 "
1967	147	82 "	17	9.5 "	204	115 "	52	28.1 "
1968	173	97 "	20	11.2 "	214	120 "	61	34.2 "
1969	213	119 "	28	15.7 "	219	123 "	64	35.9 "
1970	249	140 "	36	20.2 "	225	126 "	66	37.0 "
1971	300	168 "	44	24.6 "	232	130 "	68	38.0 "

Northfleet U.D.

1961	15	10	1	0.1 ⁰ /oo	94	58 ⁰ /oo	17	10.5 ⁰ /oo
1962	27	16	1	0.1 "	119	73 "	21	12.9 "
1963	35	22	2	1.3 "	130	80 "	27	16.6 "
1964	42	26	3	1.9 "	146	90 "	31	19.1 "
1965	57	35	6	3.7 "	179	110 "	40	24.6 "
1966	76	47	8	4.9 "	210	129 "	47	28.9 "
1967	90	55	9	5.5 "	236	145 "	55	33.8 "
1968	103	63	11	6.8 "	269	166 "	66	40.6 "
1969	127	78	14	8.6 "	293	180 "	74	45.5 "
1970	151	93	16	9.9 "	312	194 "	80	49.2 "
1971	183	112	22	13.5 "	338	208 "	94	57.8 "

Swanscombe U.D.

1961	11	15 ⁰ /oo	1	1.3 ⁰ /oo	44	58 ⁰ /oo	8	10.5 ⁰ /oo
1962	18	24 "	1	1.3 "	56	74 "	11	14.5 "
1963	25	33 "	2	2.6 "	64	84 "	13	17.1 "
1964	39	51 "	3	3.9 "	79	104 "	17	22.4 "
1965	57	75 "	5	6.6 "	88	116 "	19	25.0 "
1966	65	86 "	6	7.9 "	97	128 "	22	29.0 "
1967	93	123 "	11	14.5 "	102	134 "	23	30.1 "
1968	105	138 "	14	18.4 "	110	145 "	26	34.2 "
1969	119	157 "	23	30.3 "	116	153 "	29	38.2 "
1970	149	197 "	31	40.8 "	122	161 "	29	38.2 "
1971	183	241 "	34	44.7 "	129	170 "	33	43.4 "

HOUSES WITHOUT FIXED BATH 1961

Dartford R.D.	2542	Northfleet U.D.	1626
Dartford M.B.	1783	Swanscombe U.D.	760

General Statement

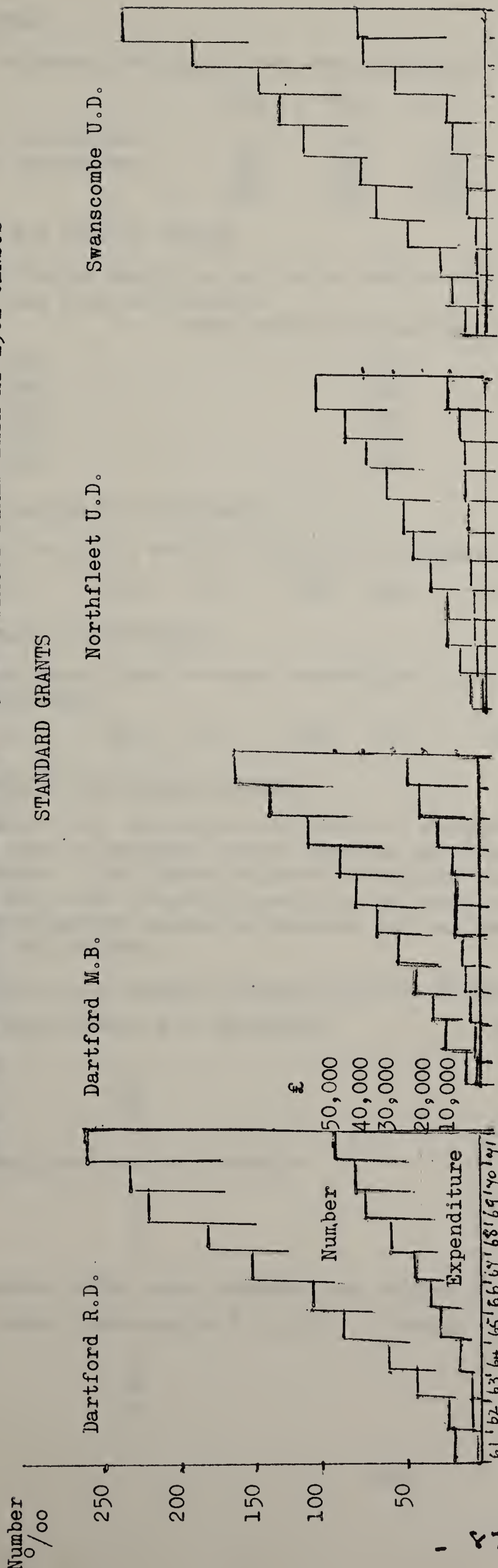
Report of the Board of Directors for the year ending December 31, 1917

Assets	Liabilities	Capital	Reserves	Income	Expenses	Profit	Loss
Cash	Accounts Payable	Common Stock	Surplus	Operating	Administrative	Net	Total
Accounts Receivable	Notes Payable	Preferred Stock	Retained Earnings	Non-Operating	Financial	Income	Expense
Inventories	Long-Term Debt	Other Equity	Accumulated Depreciation	Other	Taxes	Profit	Loss
Fixed Assets	Other Liabilities	Total Capital	Total Reserves	Total Income	Total Expenses	Total Profit	Total Loss
Total Assets	Total Liabilities	Total Equity	Total Reserves	Total Income	Total Expenses	Total Profit	Total Loss
Total Assets	Total Liabilities	Total Equity	Total Reserves	Total Income	Total Expenses	Total Profit	Total Loss
Total Assets	Total Liabilities	Total Equity	Total Reserves	Total Income	Total Expenses	Total Profit	Total Loss
Total Assets	Total Liabilities	Total Equity	Total Reserves	Total Income	Total Expenses	Total Profit	Total Loss
Total Assets	Total Liabilities	Total Equity	Total Reserves	Total Income	Total Expenses	Total Profit	Total Loss
Total Assets	Total Liabilities	Total Equity	Total Reserves	Total Income	Total Expenses	Total Profit	Total Loss
Total Assets	Total Liabilities	Total Equity	Total Reserves	Total Income	Total Expenses	Total Profit	Total Loss
Total Assets	Total Liabilities	Total Equity	Total Reserves	Total Income	Total Expenses	Total Profit	Total Loss
Total Assets	Total Liabilities	Total Equity	Total Reserves	Total Income	Total Expenses	Total Profit	Total Loss
Total Assets	Total Liabilities	Total Equity	Total Reserves	Total Income	Total Expenses	Total Profit	Total Loss
Total Assets	Total Liabilities	Total Equity	Total Reserves	Total Income	Total Expenses	Total Profit	Total Loss
Total Assets	Total Liabilities	Total Equity	Total Reserves	Total Income	Total Expenses	Total Profit	Total Loss
Total Assets	Total Liabilities	Total Equity	Total Reserves	Total Income	Total Expenses	Total Profit	Total Loss
Total Assets	Total Liabilities	Total Equity	Total Reserves	Total Income	Total Expenses	Total Profit	Total Loss
Total Assets	Total Liabilities	Total Equity	Total Reserves	Total Income	Total Expenses	Total Profit	Total Loss

Prepared by the Board of Directors

IMPROVEMENT GRANTS

NUMBER AND EXPENDITURE PER THOUSAND HOUSES WITHOUT FIXED BATH AT 1961 CENSUS



DISCRETIONARY GRANTS

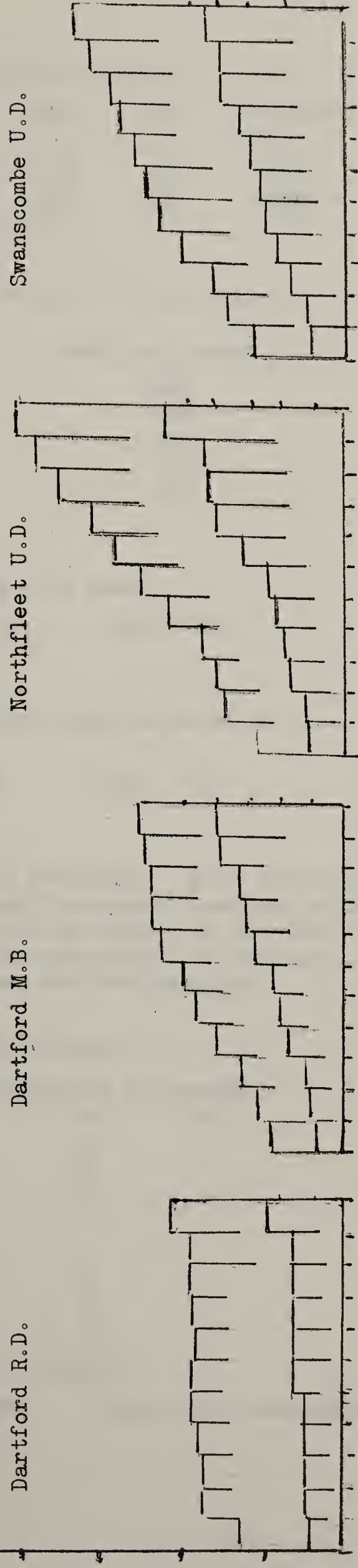


TABLE XXXIX

Northfleet U.D.

HOUSING

NEW DWELLINGS

The following dwellings have been completed in the last six years:

	1964	1965	1966	1967	1968	1969	1964/1969
By Council enterprise	78	42	55	165	155	175	670
By Private enterprise	82	126	242	202	197	107	956
	<u>160</u>	<u>168</u>	<u>297</u>	<u>367</u>	<u>352</u>	<u>282</u>	<u>1626</u>

APPLICANTS FOR COUNCIL HOUSES

At the end of March in the years 1966 to 1970 the waiting list for housing applicants has been as follows:

	Young and Middle-aged Applicants	Aged Applicants
1966	700	203
1967	880	250
1968	850	259
1969	510	237
1970	796	291

FAMILIES REHOUSED BY THE COUNCIL

During the years ending in March the numbers rehoused have been:

1966	90	1967	97	1968	248	1969	233	1970	111
------	----	------	----	------	-----	------	-----	------	-----

COUNCIL TENANTS TRANSFERRED

The following families were transferred to accommodation more suitable to their requirements:

1966	47	1967	68	1968	148	1969	98	1970	146
------	----	------	----	------	-----	------	----	------	-----

HOUSING PRIORITY ON MEDICAL GROUNDS

Ten points are available with which to express medical priority. Five are used to express need on personal health grounds and five are used to express need on public health grounds. The former relates to helping the applicant to deal with some disability or help him towards recovery or to assist nursing or management of his case. Public health grounds relate to matters such as tuberculosis and the emotional environment of children.

Housing priority on medical grounds has been recommended as follows:

Applications for rehousing		Number of points recommended		
		0	1-5	6-10
1967	11	3	7	1
1968	21	5	16	-
1969	13	3	10	-
Applications for transfer				
1967	2	-	2	-
1968	8	2	5	1
1969	7	2	5	-

Number rehoused after being awarded some degree of medical priority:

	Number rehoused by N.U.D.C.	Number transferred	Found other accommodation
1967	2	1	1
1968	6	2	-
1969	12	6	2

TABLE XXXIX (continued)

Northfleet U.D.

HOUSING (continued)

IMPROVEMENT GRANTS

	Number of dwellings improved:		Cost to the public purse:	
	With discretionary grants	With standard grants	Discretionary grants	Standard grants
1967	29	14	£5,921	£1,529
1968	13	15	£4,446	£2,086
1969	22	28	£7,466	£3,026

UNFIT HOUSES MADE FIT

	By Owner			By Council		
	1967	1968	1969	1967	1968	1969
After informal action by local authority	103	85	61	-	-	-
After formal notice under						
(a) Public Health Acts	61	19	45	-	-	-
(b) Sections 9 and 16 Housing Act, 1957	-	-	-	-	-	-
Under Section 24, Housing Act, 1957	-	-	-	-	-	-

RENT ACT, 1957

	1967	1968	1969
Applications received for Certificates of Disrepair	1	-	-
Notices issued to landlords (Form J)	1	-	-
Undertakings received from landlords (Form K)	1	-	-
Certificates of Disrepair issued (Form L)	-	-	-

Overcrowding

In 1967, 1968 and 1969 there were no proceedings to abate statutory overcrowding.

CARAVANS. The following are the details of licences issued during 1967, 1968 and 1969 under the Caravan Sites and Control of Development Act, 1960:

	1967	1968	1969
Site licences in force at end of year	2	2	2
Number of caravans permitted	12	12	12

In addition to the above, 4 showman caravans not requiring licences have been stationed in the district in these 3 years for the winter periods.

TABLE XXXIX (continued)

Northfleet U.D.

HOUSING (continued)

REPAIRS. The following are the details of repairs initiated by the Council's Public Health Inspectors:

	1967	1968	1969
Ceilings repaired or renewed	24	20	9
Walls, brickwork damp-proofed	113	99	98
Walls, internal plaster repaired	38	14	9
Doors and frames repaired or renewed	22	14	10
Firegrates repaired or renewed	3	4	1
Fireplaces, brickwork and plasterwork repaired	4	2	2
Floors, repaired or relaid	18	11	13
Floors, sub-floor ventilation provided	1	-	-
Windows, woodwork of frames, sashes or sills repaired or renewed	118	57	25
Sash lines provided	21	18	13
Chimney flues repaired	-	-	3
Sinks renewed	9	-	-
Water supply, pipes etc. repaired	9	3	4
Artificial lighting provided or repaired	3	5	3
Premises redecorated or cleansed	-	-	1
Water closets:			
External structure repaired	14	1	3
Internal structure repaired	17	6	3
Flushing cistern repaired or renewed	9	1	3
Pedestal pans repaired or renewed	3	-	1
Roofs repaired	50	22	24
Rain water pipes repaired or renewed	5	3	8
Eaves gutters repaired or renewed	15	14	19
Valley gutters repaired or renewed	4	1	3
Chimney stacks repaired or rebuilt	3	1	-
Walls, external, repaired	25	2	9
Yard surfaces repaired or relaid	2	4	5
Accumulations of refuse removed	9	-	-
Animals in an unfit state	2	-	-
Dustbins provided	19	7	1
Fences repaired or renewed	5	1	1
Dry rot	3	-	-
Staircase repaired	2	1	-
Miscellaneous	-	-	5

HOUSES DEMOLISHED OR CLOSED - HOUSING ACT, 1957

Houses demolished or closed
1967 1968 1969

Unfit houses demolished:

In Clearance Areas (Part III)

- - -

Not in Clearance Areas (Part II)

1 - 9

Unfit houses closed (Part II)

- - -

Houses acquired under Part V: acquired
demolished for redevelopment or vacated

12 12 7
22 24 9

TABLE XXXIX (continued)

Northfleet U.D.

HOUSING (continued)

ADDRESSES OF HOUSES DEMOLISHED OR CLOSED

	Clearance Areas	Section 17 etc.
1967	Nil	Lawn Road 31B, 31C (1 house, 2 separate dwellings)
1968	Nil	Nil
1969	Nil	Lawn Road 31A, 32, 33, 34, 35, 36, 37, 38 and 39

Houses acquired under Part V

1967	1968	1969
Alfred Place 1	All Saints Road 111	Alfred Place 5, 6, 9
Buckingham Road 17, 20, 21	Burch Road 31	East Street 9
Burch Road 40, 45	Burghfield Road 9	High Street 101
College Road 25	College Road 17	Lansdown Place 9
High Street 96, 108A	Coopers Road 5, 67	Station Street 2
Lansdown Place 4	Gordon Road 20	
Station Street 6, 49	Rose Street 20	
	St. Margarets Road 3	
	York Road 21, 55, 57	

Houses (acquired under Part V) demolished or vacated

1967	1968	1969
Buckingham Road 21	Buckingham Road 17, 20	Alfred Place 14
College Road 19	Burch Road 45	Burch Road 40
College Street 10, 12, 14, 15, 18, 21, 25, 26, 27, 29, 30, 31, 33, 35	College Road 12, 14, 17, 18, 28, 29, 30	College Road 25
High Street 96, 128, 132	College Street 32, 34, 38, 39, 42	East Street 9
Tooley Street 17, 19, 24	High Street 42, 48/50, 148, 150	Lansdowne Square 3
	Newmans Road 3	York Road 21, 55, 57, 59
	Tooley Street 21, 23, 25, 26	

PERSONS DISPLACED PRIOR TO CLOSURE OR DEMOLITION OF HOUSES

Year of closure or demolition	Clearance Areas	Section 17 etc.	Part V
1967	Adults - Children -	Adults 4 Children 4	No precise figure available
1968	Adults - Children -	Adults - Children -	
1969	Adults - Children	Adults 21 Children 2	

TABLE XL - WATER

QUANTITY. The supply has always been sufficient for domestic and drinking purposes.

QUALITY. In the following analyses the results of sampling are summarised by use of the following indicators:

Bacteriological: Number of E. coli (type 1) per 100 ml.

Chemical: Albuminoid ammonia expressed as nitrogen in parts per million.

Bacteriological Analyses

Samples by Medway Water Board

	1967		1968		1969	
	No. of Samples.	E. coli type 1	No. of Samples.	E. coli type 1	No. of Samples.	E. coli type 1
Hazells Pumping Station						
Raw water:	48	None	46	None	49	None
	1	2	1	1		
Treated water:	49	None	47	None	49	None
Northfleet Pumping Station						
Raw water:	50	None	45	None	60	None
	5	1 - 9	8	1 - 18+	5	2 - 6
Treated water:	55	None	53	None	65	None
Consumer's Premises						
Treated water:	7	None	1	None	1	None

Samples by Council's Public Health Inspectors

	1967		1968		1969	
	No. of Samples.	E. coli type 1	No. of Samples.	E. coli type 1	No. of Samples.	E. coli type 1
Consumer's Premises						
Treated water:	34	None	26	None	27	None

Chemical Analyses

Samples by Medway Water Board

	No. of Samples	Albuminoid Nitrogen p.p.m.	Temporary Hardness p.p.m.	Total Hardness p.p.m.
Hazells Pumping Station				
Raw water:	1967/9	None	-	-
Treated water:	1967	3	Av. 241	Av. 285
	1968	4	Av. 241	Av. 286
	1969	4	Av. 239	Av. 293
Northfleet Pumping Station				
Raw water:	1967	4	Av. 244	Av. 287
	1968	5	Av. 255	Av. 278
	1969	7	Av. 244	Av. 284
Treated water:	1967/9	None	-	-

FLUORIDE CONTENT

Too small to measure.

SWIMMING POOLS-Sampling results

The five pools in this district are at County Primary Schools.

Schools	No. of samples	E. coli type 1	Plate counts
Dover Road Swimming Pool			
1967	5	None	0,2,17,2 uncountable
1968	1	2 or more	1122
1969	1	None	1
1970	1	18+	0
1971	3	None	0, 0, 0
Istead Rise School Swimming Pool			
1969	1	None	0
1970	3	"	>500, 0, 0
1971	2	"	0, 0
Lawn Road School Swimming Pool			
1967	10	None	0, 0, 0, 0, 9, 0, 0 3 uncountable
1968	4	"	0, 0, 0, 0
1969	1	"	1 uncountable
1970	7	"	>500, 0, 0, 0, 0, 0, 0
1971	4	"	0, 0, 0, 0
Rosherville School Swimming Pool			
1967	5	None	0, 1890, 13, 2520, 908
1968	2	"	0, 2
1969	2	"	0, 450
1970	1	2+	4
	2	None	0, 0
1971	3	None	0, 0, *
Shears Green School Swimming Pool			
1967	6	None	1793, 3, 824, 0, 2 1 uncountable
1968	3	"	0, 0, 0
	1	1	87
1969	2	None	0, 2
	1	2+	1 uncountable
1970	2	None	>500, 0
	1	18+	0
1971	3	None	0, 0, 0
Planters Ash School Swimming Pool			
1971	1	None	0

* 1 plate count process overlooked

TABLE XLII NITRATE NITROGEN IN WELL WATERS. DARTFORD AND DISTRICT
Parts per million

The World Health Organisation regards 12 p.p.m. as a level which when exceeded implies a possibility of infantile metahaemoglobinaemia.

Dartford Borough

West Hill Hospital

51 samples	1953-69	6-14
	1970 Mar.	15
	Nov.	7.5
	1971 Jan.	8

J & E. Hall

Works	1953 Feb.	3
Victoria Road	1957 Feb.	14.3
Hythe Street	1958 Oct.	8
	Oct.	14

Dartford Paper Mills

Well C	1954 Mar.	11
Shed 5	1954 Mar.	8
3 throw pump	1954 Mar.	5
-do-	1954 Jan.	7
69 Priory Road	1952 Mar.	9
(One of 7 houses supplied by the Paper Mills-now changed to M.W.B.)		

Bexley Hospital

	1963 Mar.	6
--	-----------	---

London Paper Mills

No. 2 bore	1953 Jun.	6
No. 3 "	1955 Jan.	7
No. 1 "	1956 Feb.	3
No. 1 "	1965 Jun.	3
No. 1 "	1965 Jun.	6

Greaseproof Paper Mills

	1956 Feb.	10
--	-----------	----

Burroughs Wellcome

No. 3 bore	1952 Jun.	12.5
No. 1 "	1953 Feb.	2

Stanham Farm

	1952 Feb.	6
	1954 May	7
	1954 Nov.	7
	1958 July	10
	1958 Sept	7
	1958 Nov.	9

Dartford Rural District

Parish of Horton Kirby or vicinity

Paper Mills	1957 Aug	6
	1957 Oct	4
Court Lodge Farm		
	1948 Feb	7
	1948 July	6
	1949 Apr.	13
	1949 Jun	6
	1949 Dec	17
	1949 Dec	17
	1950 May	

Devon Cottages*	1948 Aug.	12.5
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Court Lodge Farm (continued)

	1951 Sept.	16.7
	1948 Feb.	8
	1949 May	17
	1949 Aug	10
	1949 Oct	10
	1950 May	7.0

Parish of Sutton-at-Hone or vicinity

Clement Street

Ayre's Cottages, 2 wells*

	1949 Mar.	10.0
	1949 Sept.	7
	1949 Nov.	3
	1950 Jan.	9.0
	1950 Jan.	9.0
	1950 Jan.	5.0
	1951 Aug.	12.5
	1952 Sept	3.0

Ayre's Cottages (continued)

	1954 Jun	10.0
	1954 Jun	10.0
	1956 Aug	12.5
	1956 Aug	11.1
	1957 Mar	8.0
	1957 Mar	11.1
	1957 July	7.0
	1957 July	7.0

*Well no longer in use.

TABLE 8.11 NITRATE NITROGEN IN WELL WATERS. DARTFORD AND DISTRICT (continued)
Parts per million

Dartford Rural District (continued)
Parish of Sutton-at-Hone (continued)

Clement Street (continued)

Ayre's Nursery

1956 Aug	10.0
1957 Mar	8.0
1957 July	7.0

Fenn's Cottages *

1949 Nov.	4
1950 Jan.	9.0
1950 Aug.	8.0

Clement House, Sutton Cottages, Northview*

1949 April	8
1948 Aug.	4
1949 Mar	10
1949 Aug	10
1951 Aug	10.0
1949 May	4
1949 Nov.	3
1950 Jan	7.0
1954 Aug	8.0
1957 Mar	8.0
1957 July	5.0

Whiffen's Cottages *

1949 Mar	10
1949 Nov	8
1956 Aug	8.0
1957 Mar	8.0
1959 July	6.0

Orchardside**

1949 Apr	7.0
1954 Jan	7.0
1950 Jan	6.0
1956 Aug	12.5
1957 Mar	10.0
1957 July	4.0

The Ferneries*

1949 Dec	8
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Thomas's Nursery

1948 Feb	11
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Parish of Stone

Stone House Hospital*

1953 Feb	15
1953 May	7.0
1953 July	7.0
1954 June	20

Stone Court Works

1949 Jan	10
1949 Aug	7

Brickfield Cottages*

1948 Nov	11.0
1949 May	8
1949 July	5
1950 Jan	8.0
1950 Sept	6.0
1951 Oct	1.0

Claypit Well, Bean*

1950 June	2.0 (Shellbank)+
1949 July	9.0
1957 Aug	5
1951 Mar	6.0 (Shellbank)+
1948 June	1 (Shellbank)+

+mixed with rainwater

Parish of Darenth

Darenth Park Hospital

1951 July	6.0
1951 July	7.0 (mixed with MWB)
1965 Aug	4.5
1971 Nov	2.0

Darenth Mill

1950 Oct	2.0
1951 Nov	4.0
1957 Aug	6
1957 Oct	3

Parish of Eynsford

Lullingstone Castle

1948 Nov	7
1950 May	6
1950 Dec	4.0
1951 June	5.0
1951 July	6.0
1951 July	5.0
1952 Sept	1.0
1963 July	3
1965 Aug	0
1966 Aug	5
1968 Apr	5.0

*well no longer in use

**well no longer in use for human consumption

TABLE XLII NITRATE NITROGEN IN WELL WATERS. DARTFORD AND DISTRICT (continued)
Parts per million

Swanscombe U.D.

The Empire Paper Mills are supplied by two wells at Cobham Terrace and one at Southfleet Road. The precise well from which water has been sampled is not always certain.

1952 January	4.0
1953 July	10
1954 April	8
1956 November	4
1956 December	8.4 (Cobham Terrace well)

TABLE XLIII

Water Authorities

The annual averages for samples from wells of the water authorities are given in the attached table.

The individual readings on which certain M.W.B. high averages were based were:

<u>Wilmington</u>	1961 Feb	8.0	<u>Southfleet</u>	1967 Feb	7.0
	May	9.0		Apr	8.0
	Aug	10.0		Aug	7.4
	1962 Feb	9.0		Nov	7.0
	May	8.0		1968 Feb	6.5
	Aug	10.0		Aug	6.5
	Nov	10.0		Nov	6.7
<u>Green Street</u>				Dec	8.7
<u>Green</u>	1960 Mar	6.0		1969 Feb	8.0
	May	6.5		May	6.4
No.1 well	Sept	7.5		Aug	6.9
No.2 well	Sept	7.5		Nov	8.1
	Dec.	8.0			
No.1 well	1961 Mar	not determined			
No.2 "	Mar	5.5			
No.1 "	June	8.0			
No.1 "	Sept	8.0			
No.2 "	Sept.	7.0			
No.1 "	Dec.	7.0			

Certain of the above readings are given to one place of decimals others to the nearest whole number hence the variation in presentation.

TABLE ~~XXX~~^{XXXV} - CHEMICAL RESULTS NITRATE NITROGEN

Individual wells of water undertakers

Nitrate nitrogen p.p.m. average readings of each year

Rawwater except where otherwise stated Well	Average nitrate nitrogen										Number of samples on which each average is based									
	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
<u>Met. Water Board</u>																				
Darenth	5.5	4.5	5.3	4.8	5.1	5.0	4.6	4.7	4.6	4.6	6	4	4	5	4	4	4	4	4	4
Dartford	5.2	4.6	4.0	4.1	4.9	4.0	3.7	4.3	4.2	4.8	5	4	4	4	4	4	4	4	4	4
Eynsford	4.1	4.1	3.7	3.7	4.2	3.6	3.9	4.0	3.8	4.7	7	8	8	7	8	8	8	8	8	8
Green St. Green	7.1	7.1	6.6	6.3	6.3	5.3	6.0	6.4	5.9	6.4	5	6	7	8	8	7	5	8	8	8
Horton Kirby	4.5	4.8	4.2	4.4	4.8	4.5	4.3	4.8	3.8	4.7	6	8	8	8	8	8	8	8	8	8
Southfleet	6.2	5.1	6.0	5.6	6.6	6.1	6.4	7.4	7.1	7.5	3	4	4	4	4	4	5	4	4	4
Wilmington	7.8	9.0	9.3	6.9	8.3	6.9	7.5	7.3	6.5	7.6	3	3	4	3	6	4	4	4	4	3
Lullingstone	-	-	-	3.4	4.0	3.1	3.2	4.0	3.6	4.5	-	-	-	6	8	8	8	8	8	8
<u>Medway Water Board</u>																				
Fawkham well (tr. + raw)		5.1	5.2	4.9	5.3	5.0	4.4	4.5	4.0	4.0	-	5	3	6	4	4	5	5	7	6
Northfleet well (a)	-	-	-	4.6	5.0	5.1	4.9	4.6	4.9	4.5	-	-	-	5	4	4	3	4	5	7
" (b)	-	-	-	5.5	5.2	5.0	4.9	5.5	5.7	6.6	-	-	-	3	4	2	3	3	4	4
(b = treated)																				
<u>Mid Kent Water Co.</u>																				
Hartley Pumping Station (treated & raw)	5.0	5.0	5.3	5.3	5.6	6.5	4.7	4.4	4.7	4.8	4	2	6	2	3	1	7	3	6	6
Stansted Pumping Station	-	-	-	-	-	-	2.9	2.7	-	-	-	-	-	-	-	-	4	1	-	-

TABLE XLV - DRAINAGE

Northfleet U.D.

Five dwellings in Wrotham Road were connected to the sewer in 1969. Of the 1,001 houses built in 1967, 1968 and 1969 one was connected to a cesspool and the remainder were connected to the sewer. The position at the end of 1969 was approximately as follows:

	Dec. 1969
Dwellings with water-closets discharging into the sewer	8,596
" " " " " into septic tanks	3
" " " " " into cesspools	<u>40</u>
Dwellings and shops with private dwelling accommodation: 31.3.69	<u>8,639</u>

The following are the details of the work initiated by the Council's Public Health Inspectors during 1967, 1968 and 1969:

	1967	1968	1969
Drains repaired or reconstructed	7	3	1
Drains cleared	18	5	4
Gully traps repaired or renewed	2	0	0
Drainage works inspected	105	38	34
Tests applied to drain (excluding Council houses)	8	12	13

WATER POLLUTION PREVENTION WORKS. Results of samples taken from the effluent were:

Samples taken by Port of London Authority

No. of Samples	Suspended solids	Albuminoid nitrogen	Oxygen absorbed in 4 hrs @ 27°C	Oxygen absorbed in 5 days @ 20°C B.O.D.
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Parts per million

Average readings

1967	1st qr.	7	48.9	4.4	26.7	64.0
	2nd qr.	8	46.0	3.7	21.8	58.9
	3rd qr.	5	37.2	4.0	23.2	50.2
	4th qr.	6	49.3	5.1	21.6	76.3
1968	1st qr.	6	55.0	5.0	24.7	85.3
	2nd qr.	6	78.3	5.2	29.7	100.2
	3rd qr.	6	80.7	8.9	29.2	48.5
	4th qr.	5	41.2	7.4	24.2	89.8
1969	1st qr.	5	42.0	7.2	22.8	79.8
	2nd qr.	4	49.8	7.0	23.5	70.8
	3rd qr.	5	39.2	5.12	18.6	47.4
	4th qr.	5	35.2	6.62	21.2	61.8

No samples were taken by Northfleet Urban District Council.

Results of samples taken by Port of London Authority from storm and humus tanks were:

27.5.69	1	160	17.0	63.0	400.0	Storm tank
27.5.69	1	52	7.1	23.0	54.0	Humus tank
3.6.69	1	90	13.0	56.0	520.0	Storm tank
3.6.69	1	30	3.6	18.0	43.0	Humus tank

Standards vary with local circumstances but as a general guide the standard asked for at our position along the river Thames is less than 31 p.p.m. suspended matter and less than 21 p.p.m. B.O.D.

X L V I
TABLE ~~XXXII~~ - DRAINAGE (continued)

STANDARDS FOR SEWAGE EFFLUENTS ENTERING R.THAMES (1933)

	Limits
Teddington to London Bridge	30 ppm suspended matter 20 ppm dissolved O ₂ absorbed in 5 days
London Bridge to 20 mile pt Long Reach	Alb.ammonia 5.0 ppm O ₂ absorbed in 3 hrs at 37°C 50.ppm
20 mile pt Long Reach to Lower Hope	Alb.ammonia 7.0 ppm O ₂ absorbed in 3 hrs at 37°C 70 ppm.

THE RIVER THAMES

"In order to improve the condition of the Thames it is essential that a high reserve of dissolved oxygen be maintained in the river. The maximum amount of oxygen that can be dissolved into a given quantity of water is termed the 100% saturation value and the Port of London Authority have set a target of a minimum oxygen content of 10% saturation in all places and at all times in the tidal Thames to be achieved by 1980". At Long Reach within the boundary of this district the tidal Thames as it lowest oxygen content.

Long Reach		Dissolved oxygen (per cent saturation) Averages			
Flow 250 mgd	Teddington	1893	Third quarter	25% approx	
"	"	1900-05	" quarters	25% "	
"	"	1920-29	" "	8% "	
"	"	1930-39	" "	6% "	
"	"	1940-49	" "	5% "	
"	"	1950-59	" "	0% "	
1848	"	1968	year	15% "	
1420	"	1969	"	18% "	
1170	"	1970	"	12% "	

The contributions in this area to the improvements of the 1960's included the reconstructions of the Crossness sewage works, the extension of sedimentation plant at the West Kent Main Sewerage Board Works, the closure of the small inefficient sewage works at Stone, the improvement of the small works at Swanscombe.

From 1964 onwards fish were periodically caught by the screens of Littlebrook and West Thurrock Generating Stations.

The improved oxygenation of the river appears also to be amenable to the organisms of the soil and intestine arriving in the effluents from the sewage works along the banks of the tidal Thames.

P.L.A. survey of River Thames 6. 10. 69

	Coliforms per 100 ml.	E coli per 100 ml.	Salmonellae per litre	Salmonellae isolated
Samples at high water				
Southend	8	3	0	
Gravesend	130	80	3	Enteritis + unnamed
Long Reach	14000	3000	13	Bredeney
Halfway Reach	25000	8000	13	Bredeney,Newport
Barking Reach	17000	8000	725	Bredeney
Woolwich	30000	5000	725	Bredeney,Reading
Limehouse	25000	5000	13	Typhimurium, Dublin
Lower Pier	11000	1000	5	Typhimurium
Chelsea	50000	20000	3	Brandenburg
Samples at half flood				
Corney Reach	13000	1000	13	Paratyphi B.Typhimurium,Stanle New-haw
Syon Reach	90000	1000	5	Typhimurium.Fischerkietz

TABLE XLVII - FOOD HYGIENE

Northfleet U.D.

FOOD PREPARATION. Food premises inspected by the Council's Public Health Inspectors were:

	Premises		
	1967	1968	1969
Bakehouses	2	2	1
Butchers	12	12	11
Cafes, restaurants, canteens etc.	29	29	28
Confectioners	22	22	21
Fish fryers and fishmongers	4	4	4
Greengrocers	14	14	14
Grocers	58	58	57
Ice-cream premises	53	55	55
Licensed premises (non-catering)	25	25	25
The number of inspections were	415	299	294

The figures for ice-cream premises is the number of premises registered most of which were also the premises of grocers or confectioners.

REGISTERED PREMISES. Section 16 of the Food and Drugs Act, 1955 requires certain premises to be registered. Those registered in 1967, 1968 and 1969 were:

	1967	1968	1969
Sausage making and cooked meats	11	12	11
Curing and preservation of fish	4	4	4
Ice-cream storage and sale	53	55	55

Visits to these premises are included in the figures tabulated above.

NOTICES. As a result of the foregoing inspections the following informal written notices were served or complied with:

Informal written notices served:		Informal written notices complied with:	
1967	8	1967	5
1968	None	1968	3
1969	None	1969	None

The following summarises the defects remedied:

	1967	1968	1969
Premises and equipment cleansed, repaired or improved	5	3	-
Provision of first aid or facilities for cleanliness	1	3	-
Protection of food from risk of contamination	-	-	-
Repair or cleaning of sanitary accommodation	-	-	-
Miscellaneous	-	-	-

Certain notices were verbal and not written.

TABLE XLVII - FOOD HYGIENE (continued)

Northfleet U.D.

MILK. Regulations require this Council to register (a) dairies not being dairy farms and (b) distributors, i.e. dairymen other than dairy farmers.

The following are the figures for registrations:

	1967	1968	1969
Distributors registered	36	39	39
Dairies registered	-	-	-

Milk sold must be designated and distributors must be licensed by the Food & Drugs Authority to use the designations. Licences issued by December 1969 were:

Pasteurised	3	Ultra heat treated	-	
Sterilised	18	Pasteurised and sterilised	10	Total 39
Untreated	-	Pasteurised, sterilised and u.h.t.	8	

FOOD REGARDED AS UNFIT FOR CONSUMPTION

Seizure of suspected food by the Council's Public Health Inspectors: Nil.

Surrender of suspected food by traders:

1967	133 lbs meat at retail shops
	144 lbs cooked meat and meat products
	41 lbs canned meats
	29 lbs other canned foods
	18 lbs other foods
1968	76 lbs meat at retail shops
	1 lb cooked meat and meat products
	19 lbs canned meats
	25 lbs other canned foods
	21 lbs other foods
1969	81 lbs meat at retail shops
	59 lbs cooked meat and meat products
	60 lbs canned meats
	90 lbs other canned foods
	28 lbs fish (fresh)
	392 lbs other foods

Submission of suspected food by complaining customers:

		1967	1968	1969
Tainted, "off" or old:	Confirmed	-	1	2
	Not confirmed	-	3	2
Moulds:	Confirmed	-	3	1
	Not confirmed	-	1	-
Dirt etc.:	Confirmed	1	3	2
	Not confirmed	-	-	-
Mineral oil:	Confirmed	1	-	1
	Not confirmed	-	-	-
Insects or their larvae:	Confirmed	-	1	1
	Not confirmed	-	-	-
Total:	Confirmed	2	8	7
	Not confirmed	-	4	2

TABLE XLVII - FOOD HYGIENE (continued)

Northfleet U.D.

Unfit food found by sampling: Nil

Meat rejected by slaughterhouses: Nil

There is no slaughterhouse in this district. One slaughterman was licensed in 1967-69 but he does this work only occasionally and outside this district.

LEGAL PROCEEDINGS. Mainly by Food and Drugs Authority.

	Food	Offending substance	Action taken
1967	Bread	Mineral oil and iron	Baker contacted.
	Bread	Smoked end of cigarette in loaf	Fined £10.
1968	Sausage roll	Mould growth	Fined £10 and £3.3.0 costs.
	Chocolate covered cream puff	Mould growth	Baker cautioned.
	Bread	Soiled dough	Baker contacted.
	Bread	Flour beetle	Baker cautioned.
	Meat pie	Mould growth	Retailer cautioned.
	Spam roll	Piece of pig's tooth	No action requested by complainant.
	Milk	Sourness	Producer advised.
1969	Bread	Mineral oil	Baker cautioned.
	Milk	Plant material	Dairy cautioned.

LABORATORY EXAMINATIONS.

Ice cream. Samples obtained and examined for cleanliness by the methylene blue test were:

Methylene blue decolourised in:	Provisional Grade	1967	1968	1969
Over 4 hrs. @ 37°C.	I	30	24	27
2½ - 4 hrs. " "	II	4	2	-
0 - 2 hrs. " "	III	1	1	-
Pre-incubation period (17 hrs. @ 20°C.)	IV	-	-	-
		<u>35</u>	<u>27</u>	<u>27</u>

Suggested standard. About 50% of samples to fall into Grade I, 80% into Grades I or II, not more than 20% into Grade III and none into Grade IV.

Milk. All milk sold must be designated milk and must satisfy prescribed tests. Sampling for these tests is done by the Food and Drugs Authority. The results of sampling were:

	Satisfactory			Unsatisfactory		
	1967	1968	1969	1967	1968	1969
Pasteurised	17	15	15	1	0 (2 void)	0 (7 void)
Sterilised	2	-	-	0	-	-
Ultra heat treated	2	-	-	0	-	-

TABLE XLVIII - FOOD CONTENT

Northfleet U.D.

SAMPLING. Samples taken by the County Sampling Officers within the Northfleet District during 1967, 1968 and 1969 were as follows. The samples were taken by the County as this Urban District is not a Food and Drugs Authority.

	1967	1968	1969
Milk	15	14	10
Drugs	5	6	5
Spirits etc.	5	5	5
Other samples	<u>45</u>	<u>42</u>	<u>48</u>
	<u>70</u>	<u>67</u>	<u>68</u>

Of the above samples all were satisfactory except:

LEGAL PROCEEDINGS etc.

	Offending substance	Action taken
From sampling:		
1967	Cola flavoured with rum. Alcoholic content low. Shandy. Alcoholic content low.	Manufacturer contacted. Manufacturer contacted.
1968	Milk loaves (3 samples). Deficient in butter.	Final sample satisfactory Baker advised.
1969	Pork sausages. Low in meat content. Liqueurchocolate bottles. Low in alcohol.	Follow-up samples satisfactory. Foreign manufacture but importer could not be traced.
Drugs:		
1967	Friars Balsam. Incorrectly described.	Manufacturer replaced existing stock.
1968	Nil.	
1969	Vapour rub. Low in methyl salicylate probably due to overlong storage.	Stock withdrawn.
Items submitted by customers:		
1967	Nil.	
1968	Loaf contained charred dough.	Baker contacted.
1969	Milk contained large piece of broken glass.	Dairy cautioned.

Tables XLVII and XLVIII
Note. In regard to ~~appendices IV and V~~, affairs relating to the fitness of food are included in Food Hygiene and affairs relating to quality are included in Food Content. The distinction is desirable as, briefly, unfit food may cause loss of health whereas poor quality food causes loss of money, e.g. unfit food = lead in cider; poor quality food = water in milk.

TABLE XLIX - HYGIENE OF PLACES OF WORK

Northfleet U.D.

FACTORIES ACT. The Council enforces the provision of sanitary conveniences in all factories. In factories without mechanical power the Council also enforces the provision of adequate cleanliness, temperature, ventilation and drainage and freedom from overcrowding. The Council keeps a register of outworkers.

	1967	1968	1969
Factories without mechanical power on register	1	1	1
" with " " " "	56	54	52
Other premises in which provision of sanitary accommodation is enforced by L.A. e.g. Building sites	25	30	40
Inspections	87	63	21
Defects found:			
Want of cleanliness	-	13	-
Ineffective drainage of floors	-	1	-
Sanitary conveniences			
(a) Insufficient	1	-	1
(b) Unsuitable or defective	-	13	1
Other offences against the act	-	15	-
Written notices served	1	4	-
Defects remedied:			
Want of cleanliness	1	5	8
Ineffective drainage of floors	-	-	1
Sanitary conveniences			
(a) Insufficient	-	-	1
(b) Unsuitable or defective	-	-	14
Other offences against the Act	1	5	10
Occupiers prosecuted	-	-	-
Outworkers in Northfleet U.D. at 31st December:			
Nature of work: Making of wearing apparel	4	9	2
Curtains and furniture hangings	1	-	1
Stuffed toys	-	3	1
Lampshades	-	1	2
Work not stated	2	2	2

OFFICES, SHOPS AND RAILWAY PREMISES ACT.

Visits under the Offices, Shops and Railway Premises Act are for enforcement in regard to cleanliness, overcrowding, temperature, ventilation, lighting, sanitary conveniences, washing facilities, supply of drinking water, accommodation for clothing, sitting facilities, seats for sedentary work, eating facilities, floors, passages and stairs, fencing of exposed parts of machinery and first aid.

	1967	1968	1969
Number of premises registered at end of year	99	99	97
Number of premises receiving general inspection	99	99	97
Number of visits by Public Health Inspectors	214	139	223
Number of contraventions found:			
Temperature	1	1	-
Sanitary conveniences	1	1	-
Washing facilities	2	1	-
Clothing accommodation	1	-	-
Fencing exposed parts of machinery	-	1	-
First aid	1	-	-
Premises inspected were:			
Offices	17	19	18
Retail shops	70	68	68
Wholesale shops and warehouses	2	2	2
Catering establishments open to public, and canteens	9	9	8
Fuel storage depots	1	1	1

Northfleet U.D.

1967	95	1968	86	1969	64
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Northfleet Urban District Council closed their premises for disinfection and disinfection at the end of 1966.

	1967	1968	1969
Woodlice	-	-	1
White cabbage flies	-	-	1
Pigeon mites	2	1	-
Wasps	48	8	26
Gooseberry mites	1	-	-
Maggots and flies	2	2	16
Bees	3	6	2
Booklice	1	-	2
Bed bugs	2	-	4
Fleas	2	8	9
Beetles, including cockroaches and carpet beetles	1	2	2
Ants	1	3	4
Crickets	-	1	1
Slugs	1	-	-
Snakes	-	-	1
Birds, including pigeons	2	9	3
Rabbits	1	-	-
Foxes	2	1	4
Silver fish	1	-	2
Flour mites	1	-	-

RODENT CONTROL. Total No. of properties (including nearby premises) inspected following notifications					278	379	414
Number infested by	(i)	Rats	85	179	145		
	(ii)	Mice	43	59	83		
Total No. of properties inspected for rats and/or mice for reason other than notification			1571	1113	1060		
Number infested by	(i)	Rats	-	-	-		
	(ii)	Mice	-	-	-		

	1967	1968	1969
Complaints received:			
Industrial premises	6	13	14
Barking dogs	-	-	1
Ice cream vendor's chimes	1	-	-
Domestic: radios, parties, etc.	1	1	2
Bird scarer	1	-	-

TABLE LII
RADIOACTIVITY
Radioactive Substances Act 1960
CERTIFICATES OF REGISTRATION UNDER SECTIONS 1 and 3

Date regis- tered	Premises	Radioactive substances	Maximum Radioactivity	Date from which use began	Registra- tion revoked w.e.f.
30 July 1963	Bowaters Paper Mills Thames Division	Thallium 204	15 millicuries	1.12.63 (sec.1)	
3 Oct. 1963	Bowater-Scott Tissue Mills	Thallium 204	20 millicuries	1.12.63 (sec.1)	
28 Nov. 1963	Bowaters Research Laboratories	Thallium 204 or Promethium 147 or Strontium 90	165 millicuries 20 millicuries 30 millicuries	1.12.63 (sec.1)	20 April 1967
4 Feb. 1965	Bowaters Paper Mills Mobile Radioactive Apparatus	Thallium 204 Strontium 90	25 millicuries 15 millicuries	5. 2.65 (sec.3)	10 May 1967
12 Mar. 1965	Bowaters Paper Mills Thames Division	Thallium 204	20 millicuries	13.3.65 (sec.1)	18 May 1967
19 Apr. 1966	Lytag Limited	Caesium 137	27 millicuries	21.4.66 (sec.1)	
10 Oct. 1966	Boyle Industrial Gauging Systems Ltd	? mobile source based at Thong Nr.Gravesend	?	10.10.66 (sec.3)	23 April 1968
19 Apr. 1967	Bowaters Research Laboratories	Thallium 204 or Promethium 147	200 millicuries 20 millicuries	20.4.67 (sec.1)	
24 May 1967	Bowaters Paper Mills Thames Division	Thallium 204	35 millicuries	25.5.67 (sec.1)	9 Nov. 1967
23 June 1967	Boyle Industrial Gauging Systems Ltd	Thallium 204 or Krypton 85 or Strontium 90 or Americium 241 Tritium	200 millicuries 5 curies 5 curies 10 curies 410 curies	26.6.67 (sec.1)	20 Jan. 1968
8 Nov. 1967	Bowaters Paper Mills Thames Division	Thallium 204 or Krypton 85	35 millicuries 520 millicuries	9.11.67 (sec.1)	16 July 1968
22 Apr. 1968	Boyle Industrial Gauging Systems Ltd (mobile source for use at Crete Hall Road)	Krypton 85 Tritium Americium 241 Strontium 90 Prometheum 147	1 curie 2.5 curies 1.2 curies 1 curie 1 curie	23.4.68 (sec.3)	
15 July 1968	Bowaters Paper Mills Thames Division	Thallium 204 or Krypton 85	35 millicuries 560 millicuries	16.7.68 (sec.1)	
22 Oct. 1969	Associated Portland Cement Manufacturers Limited	Caesium 137	310 millicuries	23.10.69 (sec.1)	
3 May 1971	Boyle Industrial Gauging Systems Ltd	Non alpha emitters other than Tritium Tritium Alpha emitters	5 curies 410 curies 20 curies	4.5.71 (sec.1)	

Radioactive waste from major nuclear power stations

Local authorities must be consulted before authorisations for the disposal of radioactive waste are granted in respect of major nuclear establishments and joint authorisation is required from both the Minister of the Environment and the Minister of Agriculture, Fisheries and Food.

In 1968 Dartford R.D., Dartford M.B. and Kent C.C. were consulted by the two Ministries and the Secretary of State for Wales on an application from the Central Electricity Generating Board for the disposal of radioactive waste oil by burning it in the oil-fired furnaces of Littlebrook Power Station. Such radioactive waste oil arises from leakage from oil seals in contact with coolant gases of reactors of nuclear power stations. Each such station incurs a waste of about 15000 gallons of such oil a year containing upto 10 curies of tritium and upto 1 curie of other radionuclides.

The proposal was for Littlebrook to burn the contaminated oil from three nuclear power stations one of which might be in Wales. Thus the oil to be burnt would contain upto 30 curies of tritium and upto 3 curies of other radionuclides. The Ministers and the Secretary of State were satisfied that the burning of such oil in such quantities would not cause hazard to public health. Emissions from the stack would contain concentrations well below the maximum recommended by the international commission and at ground level the concentration would be even less. In the ash the concentration would be so low as to require no special precautions. Transport of the oil to the power station by road would involve no special risk in the event of accident. Owing to the dispersal of the flue gases and the ash there would be no build-up of radioactivity.

Check measurements would be made.

Local calculations so far as one's limitations allowed gave conclusions in harmony with the observations of the Ministry.

The 3 curies of radioactive nuclides other than tritium would be from one or more of the following activation products: sulphur 35, calcium 45, chromium 51, manganese 54, iron 55, iron 59, cobalt 60, zinc 65, silver 110m., antimony 124 and mercury 203. There may be some fission product and alpha contamination under abnormal circumstances such as a leaking fuel element in the reactor but activation products would generally predominate.

Authorisation was issued on 26th June 1968.

The conditions for accumulation were that:

- (a) the waste is stored in the tanks used for the storage of fuel oil in bulk;
- (b) the waste is disposed of as soon as practicable.

The conditions for disposal were that:

- (a) the waste is mixed with fuel oil which is not radioactive and burnt therewith in the furnaces;
- (b) the waste disposed of does not exceed in one year 30 curies of tritium and 3 curies other radionuclides;
- (c) the Board takes samples of the waste and if so directed causes such samples to be examined, retained and the results recorded.

During 1969 the waste oil burnt at Littlebrook Power Station contained only 5.2 millicuries of tritium and 8.8 millicuries of other radionuclides. At certain other power stations burning oil with similar levels of activity measurements had shown that the burning of the contaminated oil had no detectable effect on the environment. Consequently as there was so little activity in the oil burnt at Littlebrook Power Station similar checks on the environment were not considered necessary.

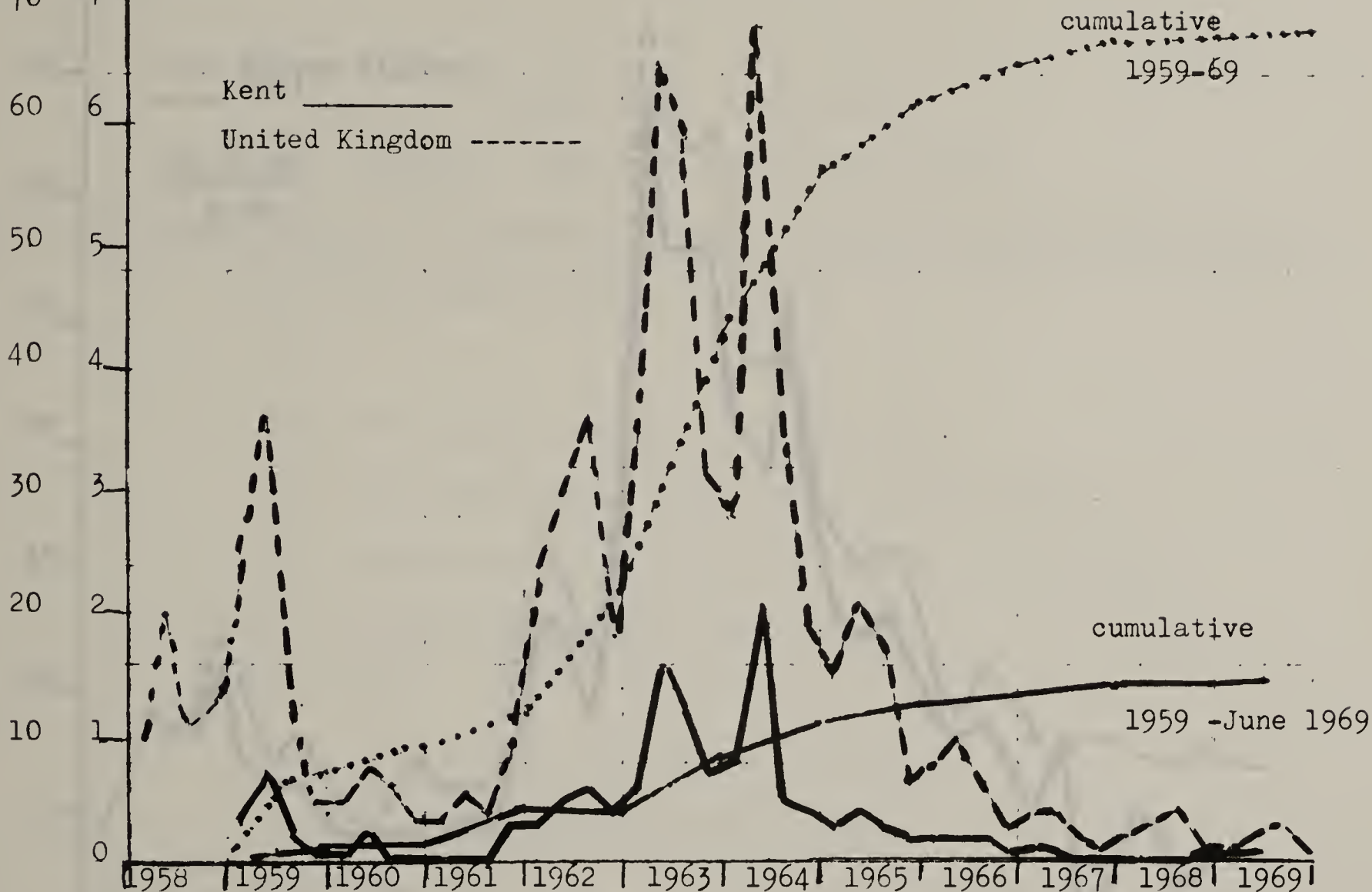
RADIOACTIVITY

RAIN

Strontium 90 deposited by rain

mCi 90 Sr/km²

Cumu -
lative Qrtly
70 7



1958-69

Quarterly deposition of Sr-90 by rain

mCi 90 Sr/km²

	Kent	U.K.		Kent	U.K.		Kent	U.K.		Kent	U.K.
1958	?	1.0	1961	0.0	0.3	1964	0.8	2.8	1967	0.1	0.4
	?	2.0		0.0	0.5		2.1	6.8		0.1	0.4
	?	1.1		0.1	0.4		0.5	3.4		0.0	0.2
	?	1.3		0.3	1.0		0.4	1.9		0.0	0.1
1959	0.3	2.4	1962	0.3	2.3	1965	0.3	1.5	1968	0.0	0.2
	0.7	3.6		0.5	3.0		0.4	2.1		0.0	0.3
	0.2	1.2		0.6	3.6		0.3	1.7		0.0	0.4
	0.1	0.5		0.4	1.8		0.2	0.7		0.1	0.1
1960	0.1	0.5	1963	0.6	3.5	1966	0.2	0.8	1969	0.1	0.1
	0.2	0.7		1.6	6.5		0.2	1.0		0.1	0.2
	0.1	0.6		1.2	5.9		0.2	0.6			0.3
	0.1	0.3		0.7	3.1		0.1	0.3			0.1

1959-69

Cumulative deposit of Sr-90 by rain

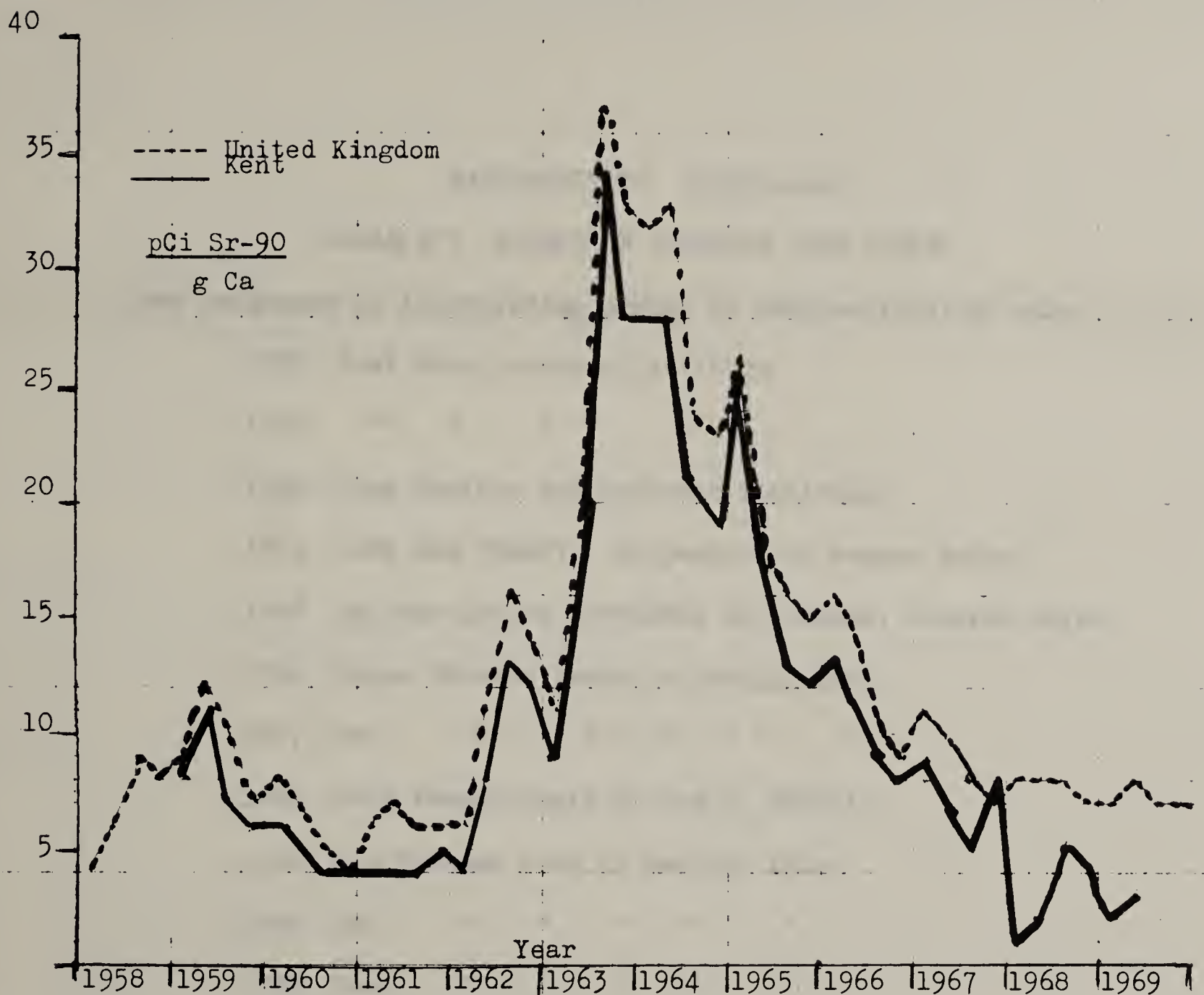
1959	1.3	7.7	1962	4.0	22.7	1965	13.1	62.6	1968	14.1	67.4
1960	1.8	9.8	1963	8.1	41.7	1966	13.8	65.3	1969	14.3*	68.1
1961	2.2	12.0	1964	11.9	56.6	1967	14.0	66.4			* to June only

Not corrected for radioactive decay

RADIOACTIVITY

MILK

Ratio of Strontium 90 to Calcium



		Milk	Strontium Units		Sr-90	pCi ⁹⁰ Sr/g Ca					
	Kent	U.K.		Kent	U.K.		Kent	U.K.		Kent	U.K.
1958	?	4	1961	4	6	1964	28	32	1967	9	11
	?	6		4	7		28	33		7	10
	?	9		4	6		21	24		5	8
	?	8		5	6		19	23		8	7
1959	8	9	1962	4	6	1965	26	26	1968	1	8
	11	12		8	11		17	19		2	8
	7	10		13	16		13	16		5	8
	6	7		12	14		12	15		4	7
1960	6	8	1963	9	11	1966	13	16	1969	2	7
	5	7		20	21		11	14		3	8
	4	5		34	37		9	10		?	7
	4	4		28	33		8	9		?	7
Annual means											
1958	?	7	1961	4	6	1964	24	28	1967	7	9
1959	8	10	1962	9	12	1965	17	19	1968	3	8
1960	5	6	1963	23	26	1966	10	12	1969	?	7

Kent measurements from reports of the County Analyst

United Kingdom measurements from reports of the Agricultural Research Council

RADIOACTIVITY (continued)

TABLE LVI ATOMIC OR HYDROGEN BOMB TESTS

For reference in interpreting graphs on radioactivity of rain

1958	Test	High	northern	latitude				
1961	"	"	"	"	"			
1962	Test	Pacific	and	northern	latitudes			
1963	TEST BAN TREATY.	Suspension	of	weapon	tests.			
1964	Nuclear device	detonated	by	Chinese,	Central Asia			
1966	Three	Chinese	tests	in	Central Asia			
1967	Two	"	"	"	"	"	"	
1968	Five	French	tests	in	the S. Pacific			
1968	One	Chinese	test	in	Central Asia			
1969	One	"	"	"	"	"	"	
1970	One	"	"	"	"	"	"	
1970	One	French	test	in	S. Pacific			

POLLUTION WITH PRODUCTS OF COMBUSTION

DOMESTIC

By the end of 1971 the number of dwellings in the Smoke Control areas 1 and 2 created in 1961 and 1962 were 1826 and 406 respectively.

INDUSTRIAL

Complaints regarding smoke nuisances were as follows:-

	1967	1968	1969	1970	1971
Paper manufacture	1	2	5	12	-
Shipping and wharves	-	1	-	-	-
Cement works	1	-	1	7	3
Bonfires (garden)	-	-	-	-	2
Demolition work	-	2	-	-	2
Wood merchant's yard	2	-	-	-	-
Lead works	1	-	-	-	-
Bakery	-	1	-	1	-
Electricity	-	1	1	1	-
Scrap metal dealers	-	-	-	2	-
	5	7	7	23	7

MEASUREMENTS

The environment of the Swanley, Horns Cross, Northfleet, Swanscombe and Dartford volumetric gauges and their readings are given on the following pages. The winter readings of all Thames-side readings are also given.

POLLUTION WITH DUST

INDUSTRIAL

Complaints regarding dust nuisance were as follows:-

	1967	1968	1969	1970	1971
Paper manufacture	3	8	7	-	1
Electricity(pulverised fuel ash)	2	2	2	1	4
Aggregate manufacture	-	1	1	-	-
Industrial tip	1	-	-	-	-
Bakery	-	1	-	1	-
Dust and overspill from lorries and tankers, train loading, and unloading of ships	-	3	1	1	13
Cement works	5	-	1	46	116
Source unknown	1	-	1	-	4
	12	15	13	49	138

MEASUREMENTS

There are 25 gauges measuring dust for the local authorities of the Thames-side areas. Only 7 of these gauges are in the area covered by Dartford M.B., Dartford R.D., Northfleet and Swanscombe Urban Districts. An extract of a separate summary of the Thames-side readings 1954 to 1969 is given in the pages that follow.

The proportional changes of the gauges in the area are illustrated by graphs on a logarithmic scale. If all the gauges change in the same proportion over a long enough period to make it likely that weather is an insignificant influence then a change of amount of emission of dust is the factor likely to be most influential in causing that change.

Another means of compensating for the influence of weather on the deposits of dust from cement works is to assume that dust from other sources is emitted in constant amounts, the percentage of dust from cement works in total dust collected by the gauges can then be regarded as an index of amount emitted.

SMELLS: Complaints regarding nuisance were:

1967-One complaint was received from a cement works(engineering dept) 1968-One from cable works(oil storage). 1969-None. 1970-Four cement works oil tankers, one Paper Mill's chimney(oil burning), one laundrette. 1971-one from the washing-out of sewage tankers on unused tip.

L V 111

AIR POLLUTION WITH PRODUCTS OF COMBUSTION
The Volumetric Gauges

The management of the local authority gauges is provided by the Council's Public Health Inspectors. The nature of the sites of the gauges needs consideration if one is to study the records of the whole area.

Swanley I Code B3 is in the public health office which is one of numerous separate well-spaced buildings in their own grounds on central heating by oil or electricity. Medium density housing lies to the North-East round to the South-West. Elsewhere there is open space.

Stone (Horns Cross) Code X is in the A.P.C.M. research laboratory which again is in park land beyond which is medium density housing in the West and North-West $\frac{2}{3}$ mile to the North are two cement works.

Swanscombe 2 Code B2 is in the precincts of the Swanscombe Council Offices in a small park amongst medium density housing with open space within $\frac{1}{4}$ mile to the South and to the North. Cement works lie $\frac{2}{3}$ mile to the North and a mile beyond is the River Thames and its open space.

Northfleet 5 Code X is on the 2nd floor of Northfleet Council Offices. In the immediate vicinity is residential housing of medium density. Open country begins within $\frac{1}{4}$ mile to the South. Within $\frac{1}{2}$ mile to the North and N.E. is an industrial area with a cement works, paper factory and electricity generating station dominating the environment. To the North beyond is the open space of the River Thames.

Dartford 6 Code D2 is in the health office in the commercial centre of the town set back 10 yards from a traffic laden street and with a park in the vicinity to the South and industry to the North.

Three gauges - Stone (Horns Cross), Swanscombe and Northfleet have cement works in the vicinity. These might be kept in mind as the dust from these works will modify the darkness of the smoke stain and it is possible that it might diminish the acidity from which the SO_2 readings are assessed.

Class Code (National Survey Site Classification)

In the national survey of which these readings form part each gauge site is given a code number as a concise way of classifying the surroundings of each site. The meanings of the codes are as follows:

- B2 Residential area with medium density housing, typically in an inner suburb or housing estate, surrounded by other built-up areas but interspersed with some industrial undertakings
- B1 Residential area with medium-density housing typically an inner suburb or housing estate, surrounded by other built-up areas.
- B3 Residential area with medium-density housing surrounded by or interspersed with areas with low potential A.P. output (park, fields, coast) or any residential area with low-density housing.
- C1 Industrial area without domestic premises
- C2 Industrial area interspersed with domestic premises of high density or in multiple occupation
- D1 Commercial area or one with predominantly central heating
- D2 Small town centre, limited commercial area mixed with old residential housing and possibly minor industry.
- E Smoke control area or smokeless zone (the letter to be added to the primary classification).
- O1 Open country but not entirely without source(s) of pollution, e.g. airfields.
- R Rural community
- X Unclassified site or mixed area
- A2 Residential area with high and medium density housing surrounded by built-up areas interspersed with industrial undertakings.

Smoke calculations. These are by use of the British Standard Smoke Calibration Curve.

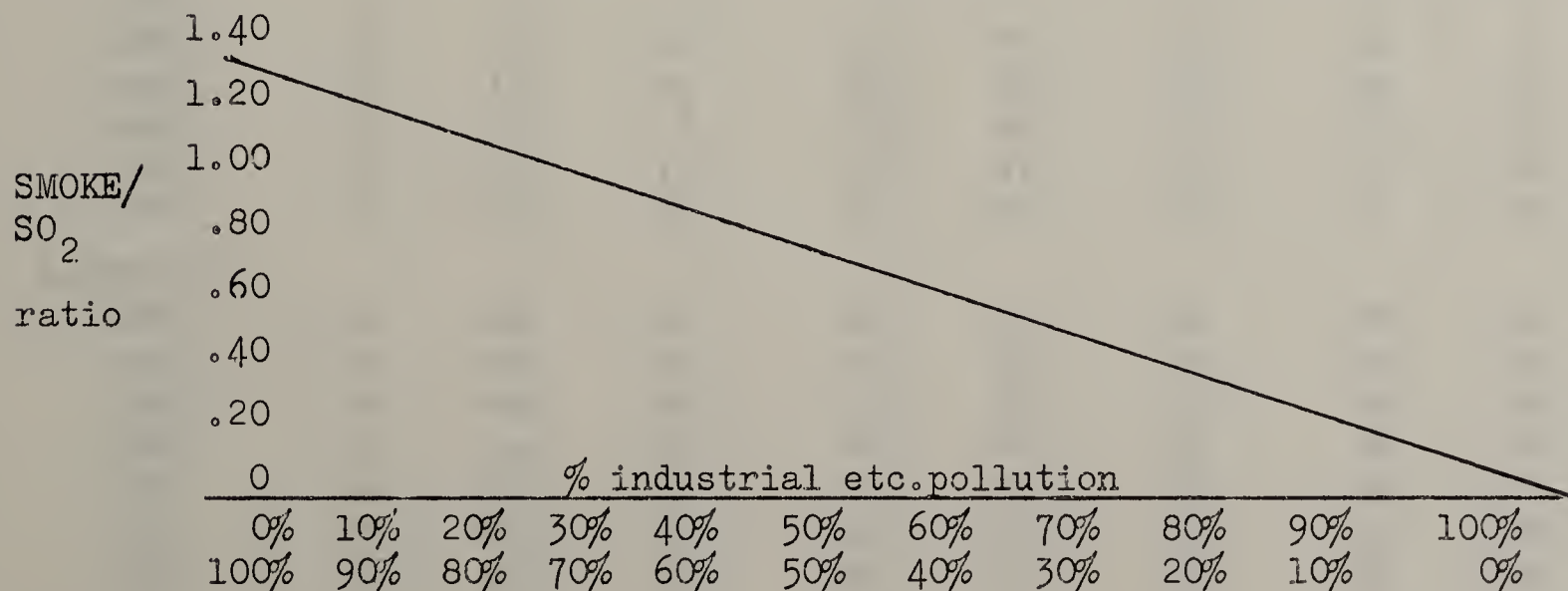
AIR POLLUTION WITH PRODUCTS OF COMBUSTION INTERPRETATION OF SMOKE/SO₂ RATIOS

In 1965 in England and Wales 0.90 million tons of smoke with 0.70 million tons of SO₂ were emitted from domestic coal-fired chimneys. From the chimneys of efficient fuel combustion i.e. industry and power stations 0.25 million tons of smoke were emitted with 5.62 million tons of SO₂ (investigation Atmos.Pull.1956-66 tables 1 and 2). Thus, the smoke/SO₂ ratios of these emissions were $90/70 = 1.29$ and $0.25/5.62 = 0.05$ and for the whole country was $0.90 + 0.25/0.70 + 5.62 = 1.15/6.32 = 0.18$. An over simplification of the ratios resulting from different proportions of the two sources was:

Domestic Coal burning	Efficient combustion (industry)
-----------------------------	---------------------------------------

Smoke/SO₂ ratio of mixture

100%	0%	$\frac{\text{Smoke}}{\text{SO}_2} = \frac{1.29 \times 100 + 0.05 \times 0}{1 \times 100 + 1 \times 0} = 1.29$
90%	10%	$\frac{\text{Smoke}}{\text{SO}_2} = \frac{1.29 \times 90 + 0.05 \times 10}{1 \times 90 + 1 \times 10} = 1.16$
80%	20%	$\frac{\text{Smoke}}{\text{SO}_2} = \frac{1.29 \times 80 + 0.05 \times 20}{1 \times 80 + 1 \times 20} = 1.04$
70%	30%	$\frac{\text{Smoke}}{\text{SO}_2} = \frac{1.29 \times 70 + 0.05 \times 30}{1 \times 70 + 1 \times 30} = 0.92$
60%	40%	$\frac{\text{Smoke}}{\text{SO}_2} = \frac{1.29 \times 60 + 0.05 \times 40}{1 \times 60 + 1 \times 40} = 0.79$
50%	50%	$\frac{\text{Smoke}}{\text{SO}_2} = \frac{1.29 \times 50 + 0.05 \times 50}{1 \times 50 + 1 \times 50} = 0.67$
40%	60%	$\frac{\text{Smoke}}{\text{SO}_2} = \frac{1.29 \times 40 + 0.05 \times 60}{1 \times 40 + 1 \times 60} = 0.55$
30%	70%	$\frac{\text{Smoke}}{\text{SO}_2} = \frac{1.29 \times 30 + 0.05 \times 70}{1 \times 30 + 1 \times 70} = 0.42$
20%	80%	$\frac{\text{Smoke}}{\text{SO}_2} = \frac{1.29 \times 20 + 0.05 \times 80}{1 \times 20 + 1 \times 80} = 0.30$
10%	90%	$\frac{\text{Smoke}}{\text{SO}_2} = \frac{1.29 \times 10 + 0.05 \times 90}{1 \times 10 + 1 \times 90} = 0.17$
0%	100%	$\frac{\text{Smoke}}{\text{SO}_2} = \frac{1.29 \times 0 + 0.05 \times 100}{1 \times 0 + 1 \times 100} = 0.05$



LX AIR POLLUTION WITH PRODUCTS OF COMBUSTION
MONTHS OF MINIMUM POLLUTION
microgrammes per cubic metre

Gauge and year	Smoke	June SO ₂	Ratio	Smoke	July SO ₂	Ratio	Smoke	August SO ₂	Ratio
SWANLEY									
1963	19	68	.28	20	54	.37	20	39	.51
1964	19	65	.29	21	75	.28	25	75	.33
1965	21	95	.22	15	68	.22	20	88	.23
1966	22	65	.34	19	70	.27	14	68	.21
1967	12	68	.18		N			N	
1968	13	66	.20	15	61	.25	13	61	.21
1969	16	72	.22	27	90	.30	12	63	.19
1970	14	84	.17	12	50	.24	15	60	.25
HORNS CROSS									
1963	15	71	.21	10	61	.16	12	48	.25
1964	16	51	.31	21	70	.30	21	67	.31
1965	15	66	.23	8	45	.18	18	53	.34
1966	19	44	.43	20	30	.67	21	28	.75
1967	15	47	.32	13	53	.25	N	N	N
1968	13	63	.21	13	40	.33	13	31	.42
1969	11	87	.13	20	76	.26	7	68	.10
1970	10	99	.10	10	44	.23	12	71	.17
NORTHFLEET									
1963	17	90	.19	11	58	.19	12	54	.22
1964	17	58	.29	17	17	.15	21	75	.28
1965	16	101	.16	13	61	.21	20	83	.24
1966	20	88	.23	22	74	.30	21	72	.29
1967	16	93	.17	17	75	.23	19	58	.33
1968	18	84	.21	16	68	.24	18	47	.38
1969	23	90	.26	18	64	.28	7	71	.10
1970	16	96	.17	11	45	.24	17	43	.40
SWANSCOMBE									
1963	-	-	-	-	-	-	-	-	-
1964	-	-	-	-	-	-	-	-	-
1965	-	-	-	-	-	-	-	-	-
1966	18	92	.20	19	55	.35	18	77	.23
1967	15	72	.21	13	62	.21	13	42	.31
1968	15	83	.18	15	66	.23	15	57	.26
1969	15	111	.14	28	97	.29	9	98	.09
1970	15	125	.12	11	62	.18	11	66	.17
DARTFORD									
1963	30	108	.28	26	76	.34	29	81	.36
1964	31	88	.35	29	91	.32	36	89	.40
1965	30	104	.29	23	74	.31	40	94	.43
1966	34	94	.36	41	81	.51	36	98	.37
1967	34	111	.31	28	97	.29	34	77	.44
1968	35	109	.32	41	102	.40	44	98	.45
1969	36	95	.38	48	111	.43	22	104	.21
1970	47	122	.39	41	55	.75	47	84	.56

L X I

AIR POLLUTION WITH PRODUCTS OF COMBUSTION
MONTHS OF MAXIMUM POLLUTION

microgrammes per cubic metre

Gauge and year	December			January			February		
	Smoke	SO ₂	Ratio	Smoke	SO ₂	Ratio	Smoke	SO ₂	Ratio
SWANLEY									
1963/64		N			N			N	
1964/65	102	208	.49	62	146	.42	65	213	.31
1965/66	51	102	.50	53	150	.35	47	83	.57
1966/67	67	120	.56	82	173	.47	57	123	.46
1967/68	90*	173	.52	66	178	.37	63	132	.48
1968/69	56	135	.41	50*	106	.47	61	181	.34
1969/70	52*	206	.25	31	120	.26	33	142	.23
1970/71	47	129	.36	43*	108	.40	48	137	.35
HORNS CROSS									
1963/64	139	149	.93	133	153	.87	171	165	1.04
1964/65	91	137	.66	54	101	.53	82	151	.54
1965/66	81	78	1.04	83	89	.93	44	54	.81
1966/67	59	73	.94	72	97	.74	47	61	.77
1967/68	66	93	.71	55	125	.44	50	78	.64
1968/69	47	95	.49	40	67	.60	60	161	.37
1969/70	46	106	.43	31	63	.49	28	109	.26
1970/71	39	57	.68	42	85	.49	50	115	.43
NORTHFLEET									
1963/64	167	157	1.06	159	175	.91	194	178	1.09
1964/65	101	198	.51	68	138	.49	87	185	.47
1965/66	93	165	.56	114	165	.69	53	101	.52
1966/67	67	142	.47	89	168	.53	58	110	.53
1967/68	87	171	.51	74	191	.39	59	105	.56
1968/69	72	113	.64	59	130	.45	83	205	.40
1969/70	62	73	.85	N	N	N	34	57	.60
1970/71	60	96	.63	48	77	.62	47	86	.55
SWANSCOMBE									
1963/64	-	-	-	-	-	-	-	-	-
1964/65	-	-	-	-	-	-	-	-	-
1965/66	94	96	.98	104	115	.90	49	63	.78
1966/67		N		85	146	.58	-	-	-
1967/68	89*	136	.65	75	159	.47	74	98	.76
1968/69	N	N	N	65	85	.76	72	190	.38
1969/70	66*	160	.41	53	95	.56	46	130	.35
1970/71	55	84	.65	47	94	.50	42	129	.33
DARTFORD									
1963/64	214	268	.80	197	282	.70	199	262	.76
1964/65	130	259	.50	91	203	.45	103	293	.33
1965/66	117	186	.63	132	226	.58	69	121	.57
1966/67	94	183	.51	116	238	.49	74	152	.49
1967/68	106	265	.40	91	304	.30	111	204	.54
1968/69	106	184	.58	81	166	.49	103	264	.39
1969/70	99	214	.46	77	139	.55	61	175	.35
1970/71	97	177	.55	75	161	.47	75	176	.43

* estimated from reflectometer of less than 40

LXII

AIR POLLUTION WITH PRODUCTS OF COMBUSTION
NUMBER OF DAYS WHEN READINGS EXCEEDED 500 MICROGRAMMES PER CUBIC METRE
Highest daily readings given with month

Code	Gauge site	Winter	Smoke	Sulphur-dioxide
B3	SWANLEY 1	1963/4	3 619 (Dec)	4 786 (Jan)
		1964/5	0 0	3 730 (Dec)
		1965/7	0	0
		1967/8	0	1 603 (Dec)
		1968/9	0	2 604 (Feb)
		1969/70	0	2 773 (Dec)
X	HORNS CROSS (STONE)1	1963/4	2 873 (Nov)	0
		1964/70	0	0
B2	SWANSCOMBE 2	1966/67	0	0
		1967/8	0	1 554 (Jan)
		1968/70	0	0
X	NORTHFLEET 5	1963/4	3 534 (Feb)	4 542 (Feb)
		1964/5	0	0
		1965/6	0	1 562 (Dec)
		1966/7	0	1 556 (Jan)
		1967/8	0	0
		1968/9	0	1 549 (Feb)
		1969/70	0	0
D2	DARTFORD 6	1963/4	5 837 (Feb)	11 785 (Jan)
		1964/5	0	8 1106 (Nov)
		1965/6	0	1 533 (Nov)
		1966/7	0	4 542 (Jan)
		1967/8	0	4 1069 (Jan)
		1968/9	0	2 575 (Jan)
				2 632 (Feb)
		1969/70	0	1 644 (Dec)

LXIII

DEGREE DAYS

	Av. 1950-70	1962-3	1963-4	1964-5	1965-6	1966-7	1967-8	1968-9	1969-70
Sept	140	202	169	143	186	129	124	101	104
Oct	291	312	308	393	272	243	224	169	207
Nov	501	560	423	425	565	515	535	474	508
Dec	647	793	796	652	590	560	633	724	687
Jan	701	1031	765	653	740	619	646	541	639
Feb	631	859	625	623	447	507	675	705	601
Mar	558	556	657	550	497	436	488	624	655
Oct-Mar	3329	4111	3574	3296	3111	2880	3201	3237	3297
April	413	410	411	383	398	434	408	418	478
May	253	310	172	233	260	261	310	245	187
Sept-May	4135	5033	4326	4055	3955	3704	4043	4001	4066
June	125	124	142	130	75	125	108	142	80
July	75	104	55	96	87	55	82	57	74
August	83	118	81	90	113	79	54	62	70
June-Aug	283	346	278	316	275	259	244	261	224

Degree day: each 1°F below 60°F maintained for 24 hours. Source Gas Council

Code	Site	1962-63	63-64	64-65	65-66	66-67	67-68	68-69	69-70
microgrammes per cubic metre									
B1	Bexleyheath 1	N	156	115	83	75	66	66	52
C2	Erith 1	92	76	N	-	-	-	-	-
A2	Erith 3	184	168	N	N	84	75	68	55
C1	Erith 4	-	-	N	56	46	N	39	51
D2	Crayford 2	101	141	65	83	77	73	76	52
B3	Sidcup 3	123	120	89	71	59	50	48	33
B3	Swanley 1	116	114	74	53	60	N	50	33
D2	Dartford 6	146	144	103	94	89	87	89	62
X	Stone I Horns Cross	102	102	N	63	52	46	43	31
B2	Swanscombe 2	-	-	-	N	N	63	61	47
X	Northfleet 5	119	118	82	76	63	58	64	N
B3/E	Thurrock 6	105	86	80	67	64	58	52	39
B1	Thurrock 7	141	139	131	113	92	94	89	87
D2	Thurrock 9	-	-	119	99	87	79	N	47
B2	Tilbury/Thurrock 26	-	-	-	-	N	N	62	57
B3	Tilbury/Thurrock 29	-	-	-	-	N	36	31	29
O1	Tilbury/Thurrock 30	-	-	-	-	N	N	34	32
O1	Tilbury/Thurrock 31	-	-	-	-	N	N	35	33
B3	Tilbury/Thurrock 32	-	-	-	-	N	54	44	N
R	Tilbury/Thurrock 33	-	-	-	-	N	32	N	N
R	Tilbury/Thurrock 34	-	-	-	-	N	26	N	N
D1	Gravesend 22	177	179	121	N	N	-	-	-
D1	Gravesend 23	-	-	-	-	-	-	45	N
B3	Strood 2	123	119	99	77	73	64	65	52
R	Kingsnorth 1	-	-	-	-	-	-	N	21
X	Kingsnorth 3	-	-	-	-	N	34	N	38
O1	Kingsnorth 4	-	-	-	-	N	N	N	30
O1	Kingsnorth 5	-	-	-	-	N	29	N	27
B3	Kingsnorth 7	-	-	-	-	N	31	N	N
X	Kingsnorth 8	-	-	-	-	N	42	N	36
B3	Kingsnorth 9	-	-	-	-	N	33	N	28
O1	Kingsnorth 10	-	-	-	-	N	34	N	31
B3	Kingsnorth 11	-	-	-	-	N	38	N	34
R	Kingsnorth 12	-	-	-	-	N	44	N	N
A1	Rochester 4	133	N	99	90	65	64	67	44
X	Chatham 3	N	134	88	84	64	57	53	51

Source National Survey

L x V

SULPHUR DIOXIDE THAMES-SIDE WINTER

Code	Site	1962-3	63-64	64-65	65-66	66-67	67-68	68-69	69-70
microgrammes per cubic metre									
B1	Bexleyheath 1	N	198	212	177	94	179	155	139
C2	Erith 1	185	60	N	-	-	-	-	-
A2	Erith 3	280	217	N	N	202	214	157	157
C1	Erith 4	-	-	N	114	137	N	160	184
D2	Crayford 2	293	209	177	166	141	177	184	132
B3	Sidcup 3	216	185	195	163	123	133	133	110
B3	Swanley 1	182	141	169	124	120	N	123	135
D2	Dartford 6	256	N	225	181	173	202	173	150
X	Stone I Horns Cross	143	110	N	84	67	75	96	83
B2	Swanscombe 2	-	-	-	N	N	108	108	111
X	Northfleet 5	190	125	164	152	127	126	130	N
B3/E	Thurrock 6	198	159	169	129	138	124	101	134
B1	Thurrock 7	192	150	168	141	167	138	119	140
D2	Thurrock 9	-	-	169	118	141	135	N	129
B2	Tilbury/Thurrock 26	-	-	-	-	N	N	131	128
B3	Tilbury/Thurrock 29	-	-	-	-	N	116	76	81
O1	Tilbury/Thurrock 30	-	-	-	-	N	N	93	100
O1	Tilbury/Thurrock 31	-	-	-	-	N	N	82	89
B3	Tilbury/Thurrock 32	-	-	-	-	N	195	124	N
R	Tilbury/Thurrock 33	-	-	-	-	N	134	N	N
R	Tilbury/Thurrock 34	-	-	-	-	N	96	N	N
D1	Gravesend 22	190	163	154	121	N	-	-	-
D1	Gravesend 23	-	-	-	-	-	-	112	100
B3	Strood 2	155	131	143	111	107	134	116	126
R	Kingsnorth 1	-	-	-	-	-	-	N	88
X	Kingsnorth 3	-	-	-	-	N	98	N	97
O1	Kingsnorth 4	-	-	-	-	N	N	N	80
O1	Kingsnorth 5	-	-	-	-	N	76	N	69
B3	Kingsnorth 7	-	-	-	-	N	104	N	N
X	Kingsnorth 8	-	-	-	-	N	118	N	97
B3	Kingsnorth 9	-	-	-	-	N	118	N	117
O1	Kingsnorth 10	-	-	-	-	N	86	N	81
B3	Kingsnorth 11	-	-	-	-	N	98	N	84
R	Kingsnorth 12	-	-	-	-	N	103	N	N
A1	Rochester 4	158	N	121	109	107	99	90	82
X	Chatham 3	N	130	144	134	109	112	155	97

L x v1

SMOKE/SO₂ RATIO THAMES-SIDE WINTER

Code	Site	1962-3	63-64	64-65	65-66	66-67	67-68	68-69	69-70
microgrammes per cubic metre									
B1	Bexleyheath 1	N	.79	.54	.47	.80	.37	.43	.37
C2	Erith 1	.50	1.27	N	-	-	-	-	-
A2	Erith 3	.66	.77	N	N	.42	.35	.43	.35
C1	Erith 4	-	-	N	.49	.34	N	.24	.28
D2	Crayford 2	.34	.67	.37	.50	.55	.41	.41	.39
B3	Sidcup 3	.57	.65	.46	.44	.48	.38	.36	.30
B3	Swanley 1	.64	.81	.44	.43	.50	N	.41	.24
D2	Dartford 6	.57	N	.46	.52	.51	.43	.51	.41
X	Stone I Horns Cross	.71	.93	N	.75	.78	.61	.45	.37
B2	Swanscombe 2	-	-	-	N	N	.58	.56	.42
X	Northfleet 5	.63	.94	.50	.50	.50	.46	.49	N
B3/E	Thurrock 6	.53	.54	.47	.52	.46	.47	.51	.29
B1	Thurrock 7	.73	.93	.78	.80	.55	.68	.75	.62
D2	Thurrock 9	-	-	.70	.84	.62	.59	N	.36
B2	Tilbury/Thurrock 26	-	-	-	-	N	N	.47	.45
B3	Tilbury/Thurrock 29	-	-	-	-	N	.31	.41	.36
O1	Tilbury/Thurrock 30	-	-	-	-	N	N	.37	.32
O1	Tilbury/Thurrock 31	-	-	-	-	N	N	.43	.37
B3	Tilbury/Thurrock 32	-	-	-	-	N	.28	.35	N
R	Tilbury/Thurrock 33	-	-	-	-	N	.24	N	N
R	Tilbury/Thurrock 34	-	-	-	-	N	.27	N	N
D1	Gravesend 22	.93	1.10	.79	N	N	-	-	-
D1	Gravesend 23	-	-	-	-	-	-	.40	N
B3	Strood 2	.79	.91	.68	.69	.68	.48	.56	.41
R	Kingsnorth 1	-	-	-	-	-	-	N	.24
X	Kingsnorth 3	-	-	-	-	N	.35	N	.39
O1	Kingsnorth 4	-	-	-	-	N	N	N	.38
O1	Kingsnorth 5	-	-	-	-	N	.38	N	.39
B3	Kingsnorth 7	-	-	-	-	N	.30	N	N
X	Kingsnorth 8	-	-	-	-	N	.35	N	.37
B3	Kingsnorth 9	-	-	-	-	N	.28	N	.24
O1	Kingsnorth 10	-	-	-	-	N	.40	N	.38
B3	Kingsnorth 11	-	-	-	-	N	.39	N	.40
R	Kingsnorth 12	-	-	-	-	N	.43	N	N
A1	Rochester 4	.84	N	.82	.83	.61	.65	.74	.54
X	Chatham 3	N	1.03	.61	.62	.59	.51	.34	.53

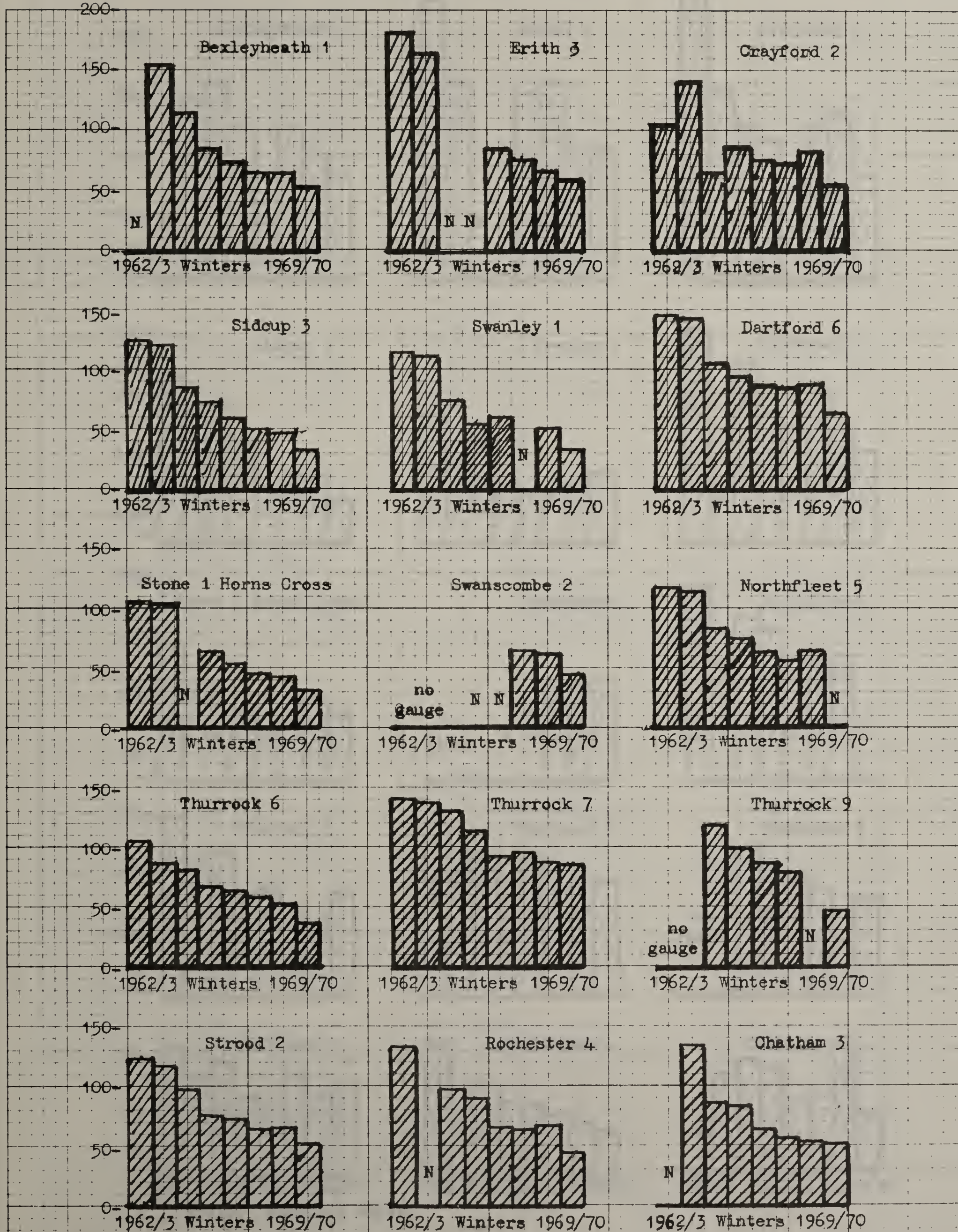
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SMOKE THAMES-SIDE WINTER
microgrammes per cubic metre



Source National Survey

SULPHUR DIOXIDE THAMES-SIDE WINTER
microgrammes per cubic metre

300-

250-

200-

150-

100-

70-

250-

200-

150-

100-

200-

150-

100-

50-

200-

150-

100-

70-

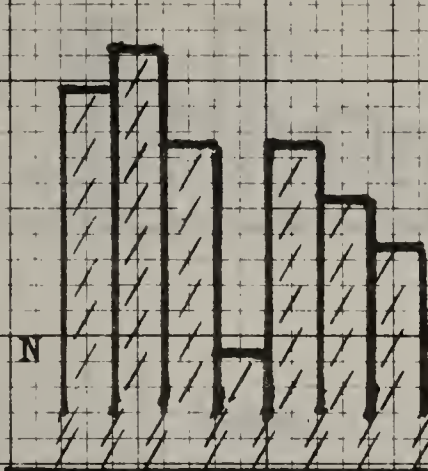
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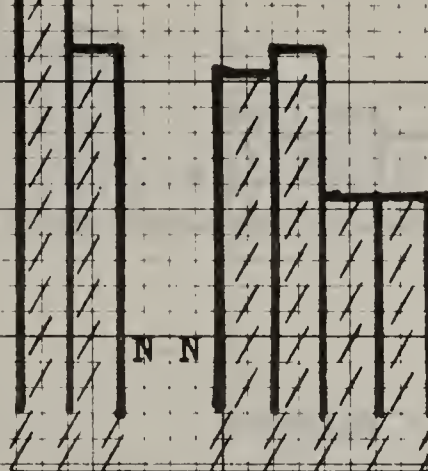
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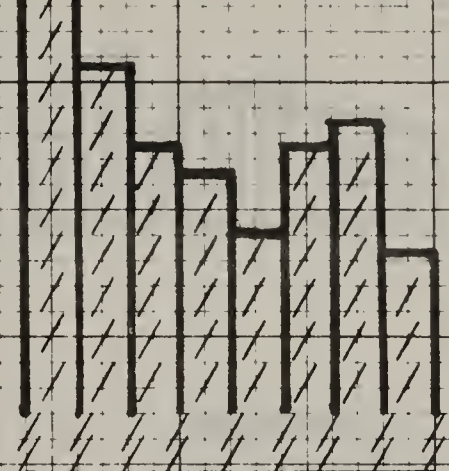
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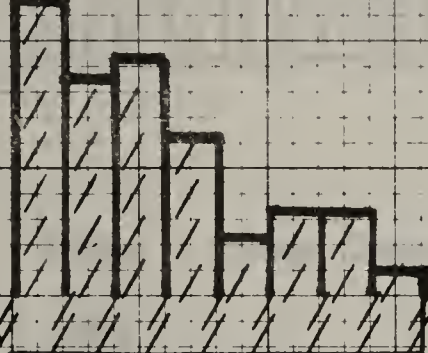
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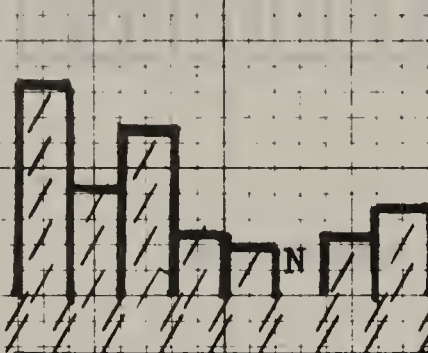
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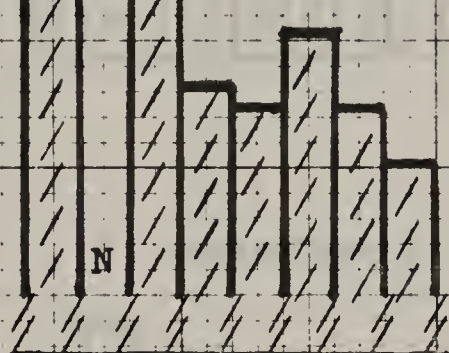
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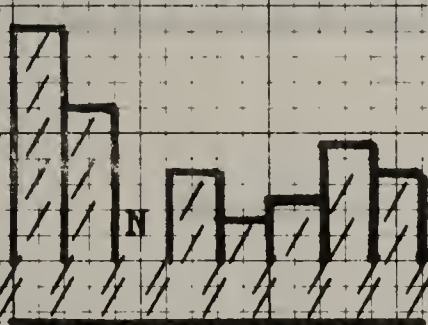
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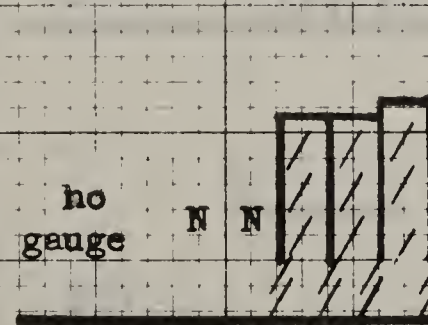
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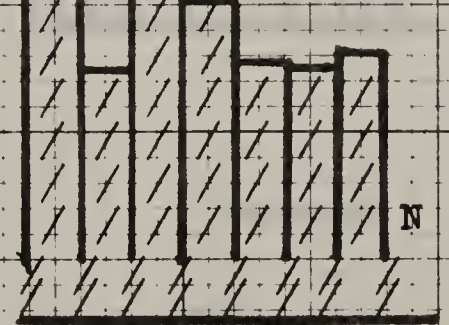
Stone 1 Horns Cross



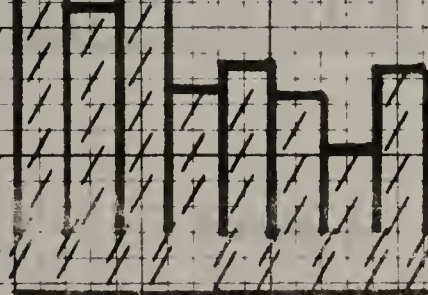
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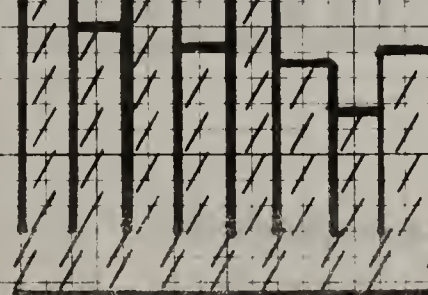
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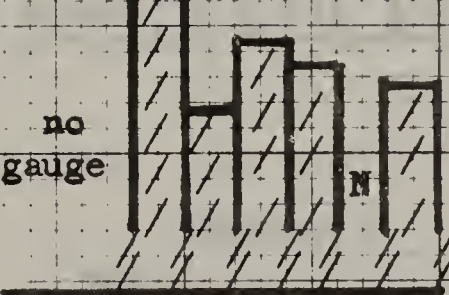
Thurrock 6



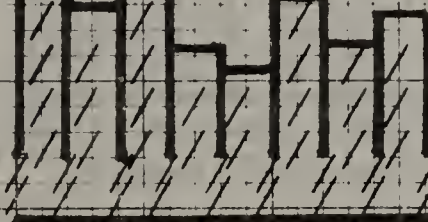
Thurrock 7



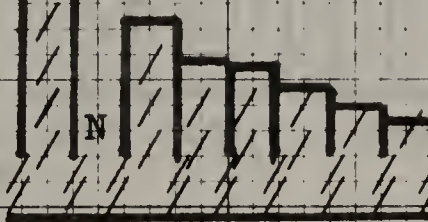
Thurrock 9



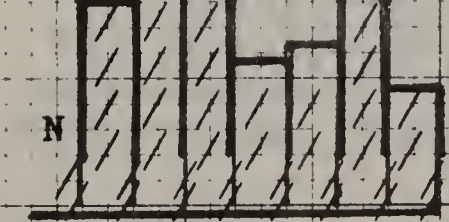
Strood 2



Rochester 4



Chatham 3



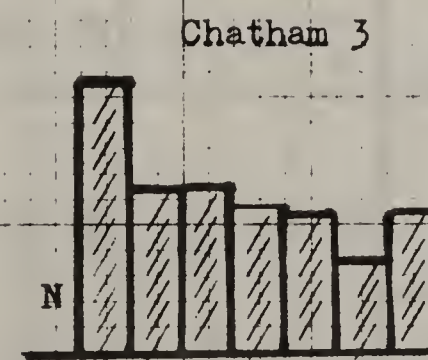
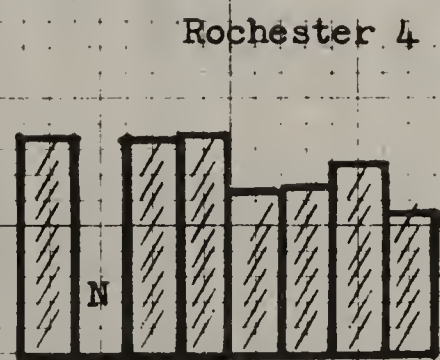
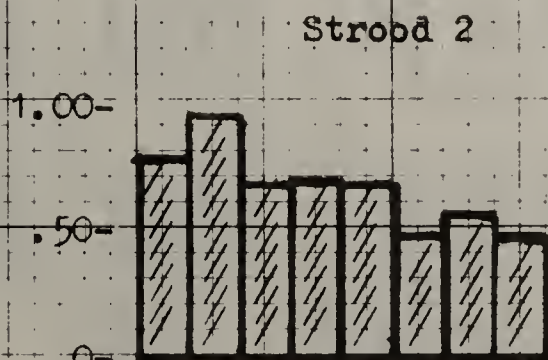
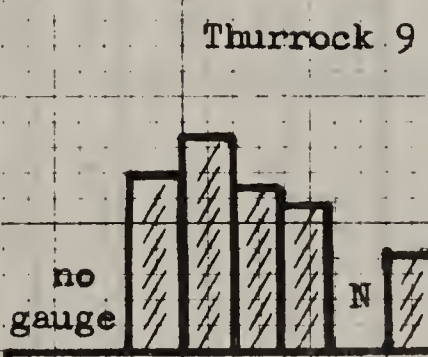
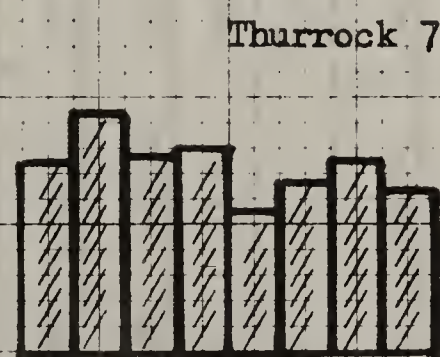
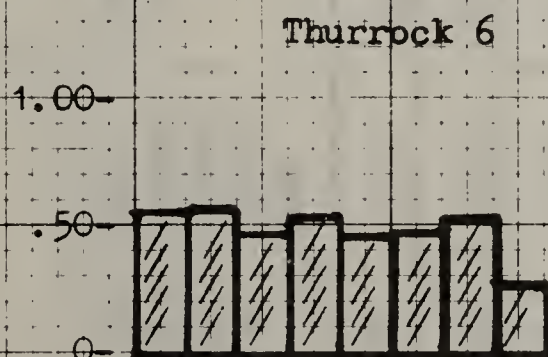
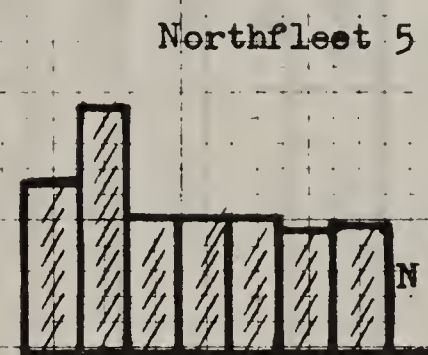
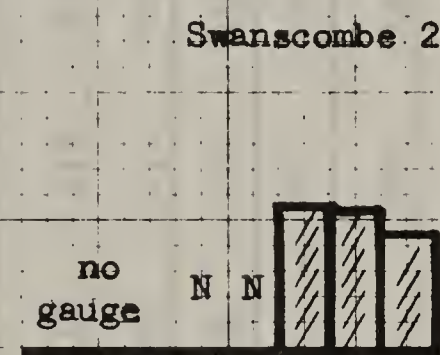
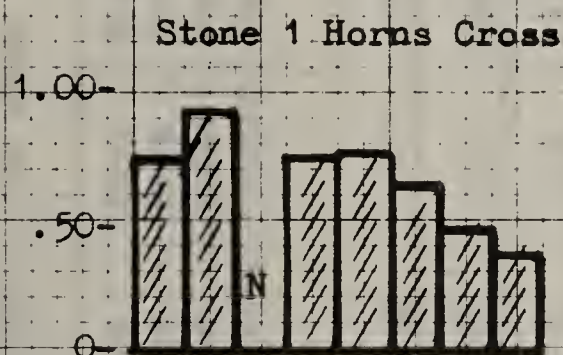
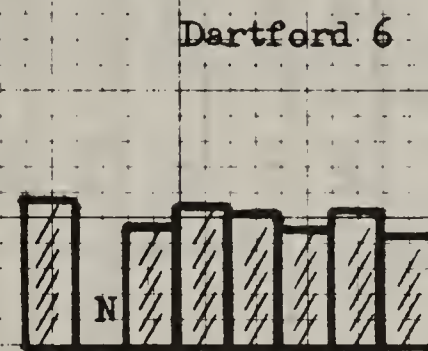
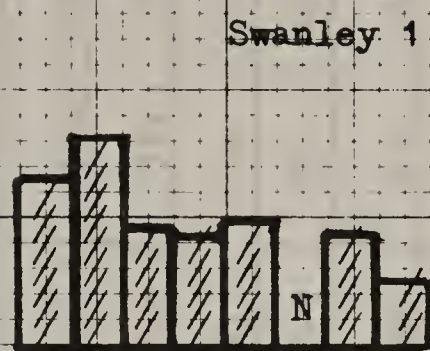
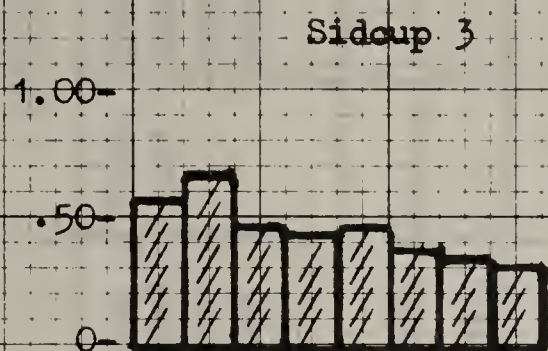
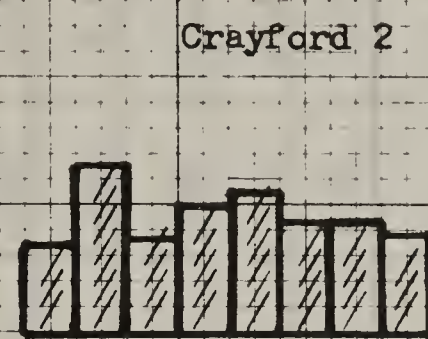
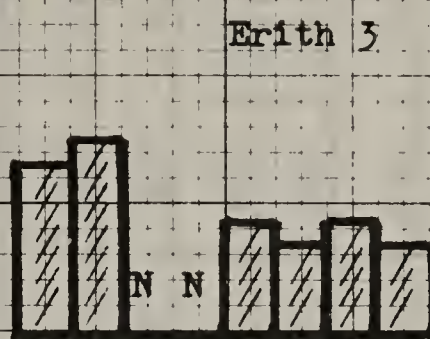
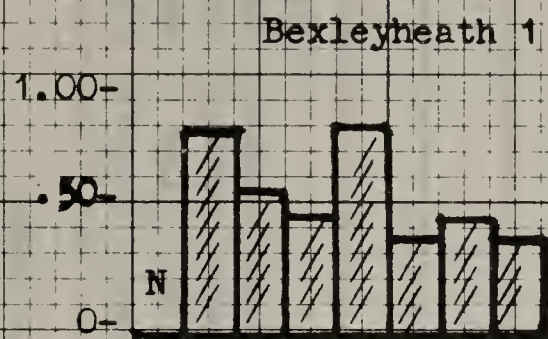
1962/3 Winters 1969/70

1962/3 Winters 1969/70

1962/3 Winters 1969/70

Source National Survey

SMOKE/SO₂ RATIO THAMES-SIDE WINTER
microgrammes per cubic metre



1962/3 Winters 1969/70

1962/3 Winters 1969/70

1962/3 Winters 1969/70

Source: National Survey

DARTFORD CENTRAL

DARTFORD BOW ARROW

DARTFORD JOYCE GREEN

Year ending March	Total dust	Dust from other sources	Dust from cement works	% dust from cement works	Ratio cement works/other dust	Total dust	Dust from other sources	Dust from cement works	% dust from cement works	Ratio cement works/other dust	Total dust	Dust from other sources	Dust from cement works	% dust from cement works	Ratio cement works/other dust
1954-55	299	218	81	27%	0.37	283	196	87	31%	0.44					
1955-56	352	235	117	33%	0.50	400	209	191	48%	0.91					
1956-57	^e 305	216	89	29%	0.41	294	172	122	42%	0.71	368	270	98	27%	0.36
1957-58	297	209	88	30%	0.42	374	209	165	44%	0.79	360	255	105	29%	0.41
1958-59	273	175	98	36%	0.56	353	174	179	51%	1.03	396	245	151	38%	0.62
1959-60	303	157	146	46%	0.82	451	180	271	60%	1.51	339	179	160	47%	0.89
1960-61	273	143	130	48%	0.91	385	132	253	66%	1.92	384	222	162	42%	0.73
1961-62	313	145	168	54%	1.16	^c 406	109	297	73%	2.72	^a 363	160	^a 203	56%	1.27
1962-63	288	125	163	57%	1.30	^b 411	106	305	74%	2.88	^h 259	164	95	37%	0.58
1963-64	263	140	123	47%	0.88	375	166	209	56%	1.26	^a 343	188	^a 155	45%	0.32
1964-65	248	175	73	29%	0.42	345	220	125	36%	0.57	262	174	88	34%	0.51
1965-66	228	160	68	30%	0.43	337	220	117	35%	0.53	278	205	73	26%	0.36
1966-67	264	179	85	32%	0.47	^c 421	286	135	32%	0.48	^d 331	265	^d 56	17%	0.21
1967-68	260	180	80	31%	0.44	^c 333	202	131	39%	0.64	^a 293	204	^a 88	30%	0.44
1968-69	^b 297	171	126	42%	0.74	^a 411	201	210	51%	1.04	^b 347	248	^b 99	29%	0.50
Total	4263	2648	1635	38%	0.62	5579	2782	2797	50%	1.00	4313	2779	1534	36%	0.54
Yearly Mean	284	177	108			372	185	187			332	214	117		

DEPOSIT GAUGE READINGS

HORNS CROSS

SWANSCOMBE

NORTHFLEET

Year ending March	Total dust	Dust from other sources	Dust from cement works	% dust from cement works	Ratio cement works/ other dust	Total dust	Dust from other sources	Dust from cement works	% dust from cement works	Ratio cement works/ other dust	Total dust	Dust from other sources	Dust from cement works	% dust from cement works	Ratio cement works/ other dust
1954-55	620	204	416	67%	2.04	554	235	319	58%	1.36	448	190	258	58%	1.36
1955-56	685	251	434	63%	1.73	607	250	357	59%	1.43	545	220	325	60%	1.48
1956-57	578	172	406	70%	2.37	470	183	287	61%	1.57	428	161	267	63%	1.66
1957-58	643	223	420	65%	1.88	602	275	327	54%	1.19	517	236	281	54%	1.19
1958-59	573	184	389	68%	2.11	587	264	323	55%	1.22	597	325	272	46%	0.84
1959-60	678	186	492	73%	2.65	603	209	394	65%	1.83	658	224	434	66%	1.93
1960-61	^c 576	129	447	77%	3.47	^a 508	123	385	76%	3.13	448	116	332	74%	2.86
1961-62	720	116	604	84%	5.20	^c 494	102	392	79%	3.84	450	107	343	76%	3.20
1962-63	^c 729	145	584	80%	4.04	^c 456	75	381	83%	5.08	433	72	361	84%	5.00
1963-64	562	103	459	82%	4.46	470	124	346	74%	2.79	432	132	300	69%	2.27
1964-65	588	130	458	78%	3.53	493	182	311	63%	1.71	407	169	238	58%	1.41
1965-66	^d 610	264	346	57%	1.31	505	211	294	58%	1.39	418	196	222	53%	1.13
1966-67	^a 618	259	359	58%	1.37	490	174	316	65%	1.83	^c 445	221	224	50%	0.99
1967-68	590	210	380	65%	1.81	444	172	272	61%	1.59	N	N	N		
1968-69	^a 735	274	461	63%	1.70	^e 486	204	282	58%	1.38	N	N	N		
Total	9505	2850	6655	70%	2.34	7769	2783	4986	65%	1.78	6226	2369	3857	62%	1.63
Yearly Mean	634	190	444			517	186	333			479	183	298		

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DEPOSIT GAUGE READINGS

LONDON FRINGE GROUP excluding SWANLEY

DARTFORD GROUP excl. SOUTHERN HOSPITAL

JOHNS CROSS SWANSCOMBE NORTHFLEET

Year ending March	Total dust	Dust from other sources	Dust from cement works	% dust from cement works	Ratio cement works/other dust	Total dust	Dust from other sources	Dust from cement works	% dust from cement works	Ratio cement works/other dust	Total dust	Dust from other sources	Dust from cement works	% dust from cement works	Ratio cement works/other dust
1954-55											1622	629	993	61%	1.58
1955-56											1837	721	1116	61%	1.55
1956-57	912	740	172	19%	0.23	967	658	309	32%	0.47	1476	516	960	65%	1.86
1957-58	934	795	139	15%	0.18	1031	673	358	35%	0.53	1762	734	1028	58%	1.40
1958-59	920	716	204	22%	0.28	1022	594	428	42%	0.72	1757	773	984	56%	1.28
1959-60	1026	738	288	28%	0.39	1093	516	577	53%	1.13	1939	619	1320	68%	2.14
1960-61	929	695	234	25%	0.34	1042	497	545	52%	1.09	1532	368	1164	76%	3.18
1961-62	1019	726	293	29%	0.40	1082	414	668	62%	1.63	1664	325	1339	80%	4.12
1962-63	1033	722	311	30%	0.43	958	395	563	59%	1.43	1618	292	1326	82%	4.56
1963-64	888	673	215	24%	0.32	981	494	487	50%	0.99	1464	359	1105	75%	3.08
1964-65	856	747	109	13%	0.15	855	569	286	33%	0.50	1488	481	1007	67%	2.09
1965-66	917	784	133	15%	0.17	843	585	258	31%	0.44	1533	671	862	56%	1.28
1966-67	925	835	90	10%	0.11	1016	740	276	27%	0.37	1553	654	899	58%	1.37
1967-68	895	763	132	15%	0.17	886	586	300	34%	0.51		No gauge at Northfleet			
1968-69	1022	770	252	25%	0.33	1055	620	435	41%	0.70					
Total	12276	9704	2572	21%	0.27	12831	7361	5470	42%	0.72	21245	7142	14103	67%	1.98
Yearly Mean	944	746	198			987	566	421			1638	548	1085		

Year ending March	DEPOSIT GAUGE READINGS										GRAVESEND GAUGES COMBINED				
	GRAVESEND DASHWOOD					GRAVESEND SWIMMING BATHS					GRAVESEND GAUGES COMBINED				
	Total dust	Dust from other sources	Dust from cement works	% dust from cement works	Ratio cement works/ other dust	Total dust	Dust from other sources	Dust from cement works	% dust from cement works	Ratio cement works/ other dust	Total dust	Dust from other sources	Dust from cement works	% dust from cement works	Ratio cement works/ other dust
1954-55															
1955-56															
1956-57	211	144	67	32%	0.47	202	138	64	32%	0.46	413	282	131	32%	0.47
1957-58	239	190	49	20%	0.26	239	183	56	23%	0.31	478	373	105	22%	0.28
1958-59	241	179	62	25%	0.35	233	169	64	27%	0.38	474	348	126	27%	0.36
1959-60	187	124	63	34%	0.51	219	151	68	31%	0.45	406	275	131	32%	0.48
1960-61	206	133	73	35%	0.55	227	157	70	31%	0.45	433	290	143	33%	0.49
1961-62	201	125	76	37%	0.61	214	145	69	32%	0.48	415	270	145	35%	0.54
1962-63	193	128	65	34%	0.51	^c 195	135	60	30%	0.44	388	263	125	32%	0.48
1963-64	199	144	55	28%	0.38	221	162	59	27%	0.36	420	306	114	27%	0.37
1964-65	207	164	43	21%	0.26	214	165	49	23%	0.30	421	329	92	22%	0.28
1965-66	188	148	40	21%	0.27	210	166	44	21%	0.27	398	314	84	21%	0.27
1966-67	250	211	39	16%	0.19	226	196	30	13%	0.15	476	407	69	14%	0.17
1967-68	^b 195	158	37	19%	0.23	208	181	27	13%	0.15	403	339	64	15%	0.18
1968-69	^a 277	242	35	13%	0.15	^a 204	169	35	17%	0.20	481	411	70	14%	0.15
Total	2794	2090	704	26%	0.35	2812	2117	695	25%	0.32	5606	4207	1399	25%	0.33
Yearly Mean	215	161	54			216	163	53			431	323	107		

DEPOSIT GAUGE READINGS

LONDON FRINGE GROUP excl. SWANLEY - DARTFORD GROUP excl. SOUTHERN HOSPITAL- HORNS CROSS, SWANSCOMBE, NORTHFLEET, GRAVESEND

13 GAUGES COMBINED

Year ending March	Total dust	Dust from other sources	Dust from cement works	% dust from cement works	Ratio: cement works/ other dust	Ratio: other dust/ dust from cement wks	% dust from other sources
1956-57	3768	2196	1572	42%	0.72	1.39	58%
1957-58	4205	2575	1630	39%	0.63	1.58	61%
1958-59	4173	2431	1742	42%	0.72	1.39	58%
1959-60	4464	2148	2316	52%	1.08	0.93	48%
1960-61	3936	1850	2086	53%	1.13	0.89	47%
1961-62	4180	1735	2445	59%	1.41	0.71	41%
1962-63	3997	1672	2325	58%	1.39	0.72	42%
1963-64	3753	1832	1921	51%	1.05	0.95	49%
1964-65	3620	2126	1494	41%	0.70	1.43	59%
1965-66	3691	2354	1337	36%	0.57	1.76	64%
1966-67	3970	2636	1334	34%	0.51	1.97	66%
1956-67	43757	23565	20202	46%	0.86	1.17	54%

In the foregoing tables:

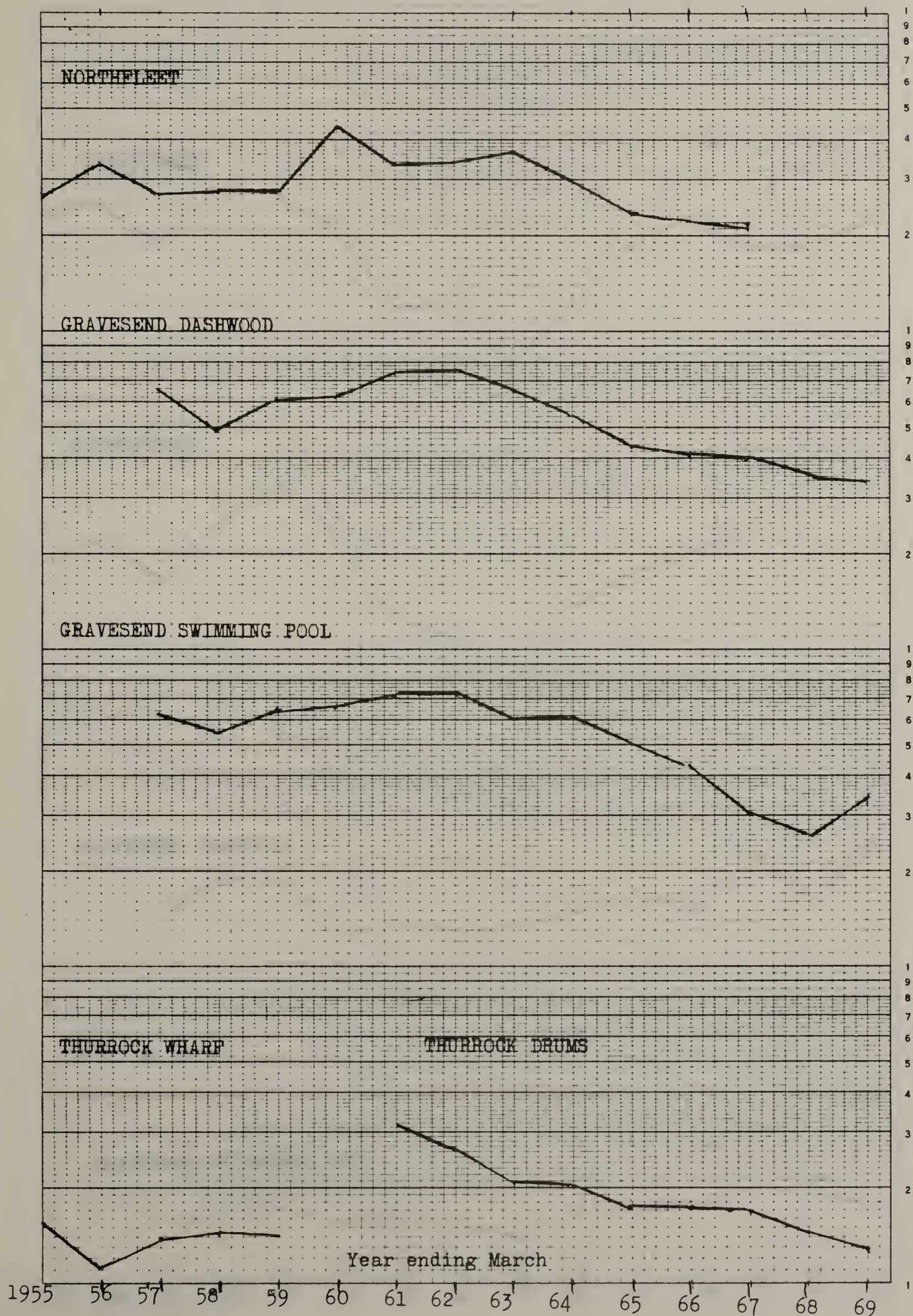
The individual gauge readings for each year are given as tons per sq.mile.

To convert to milligrams per sq metre per day, multiply the amount of deposits by - $\frac{12}{12}$

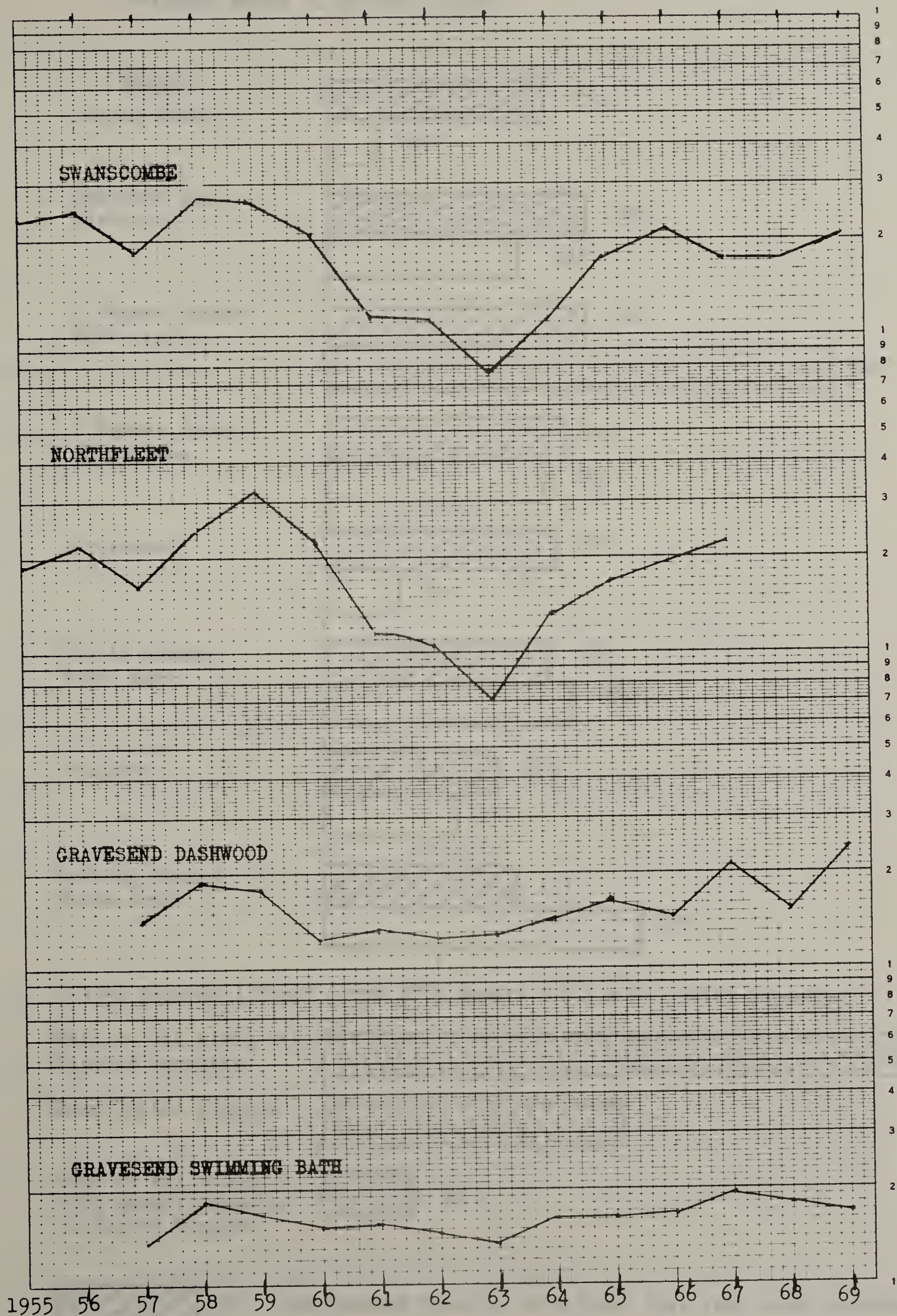
Key to abbreviations in tables:

- a Total of 6 winter months and a summer figure for 6 months estimated from 5
- b Ditto " " 4
- c Total of 6 summer months and a winter figure for 6 months estimated from 5
- d Ditto " " 4
- e A winter figure for 6 months estimated from 5 and a summer figure for 6 months estimated from 5
- f A winter figure for 6 months estimated from 4 and a summer figure for 6 months estimated from 5
- g A winter figure for 6 months estimated from 5 and a summer figure for 6 months estimated from 4
- h Contains an estimate for a half year based on 3 monthly readings.

DUST FROM CEMENT WORKS

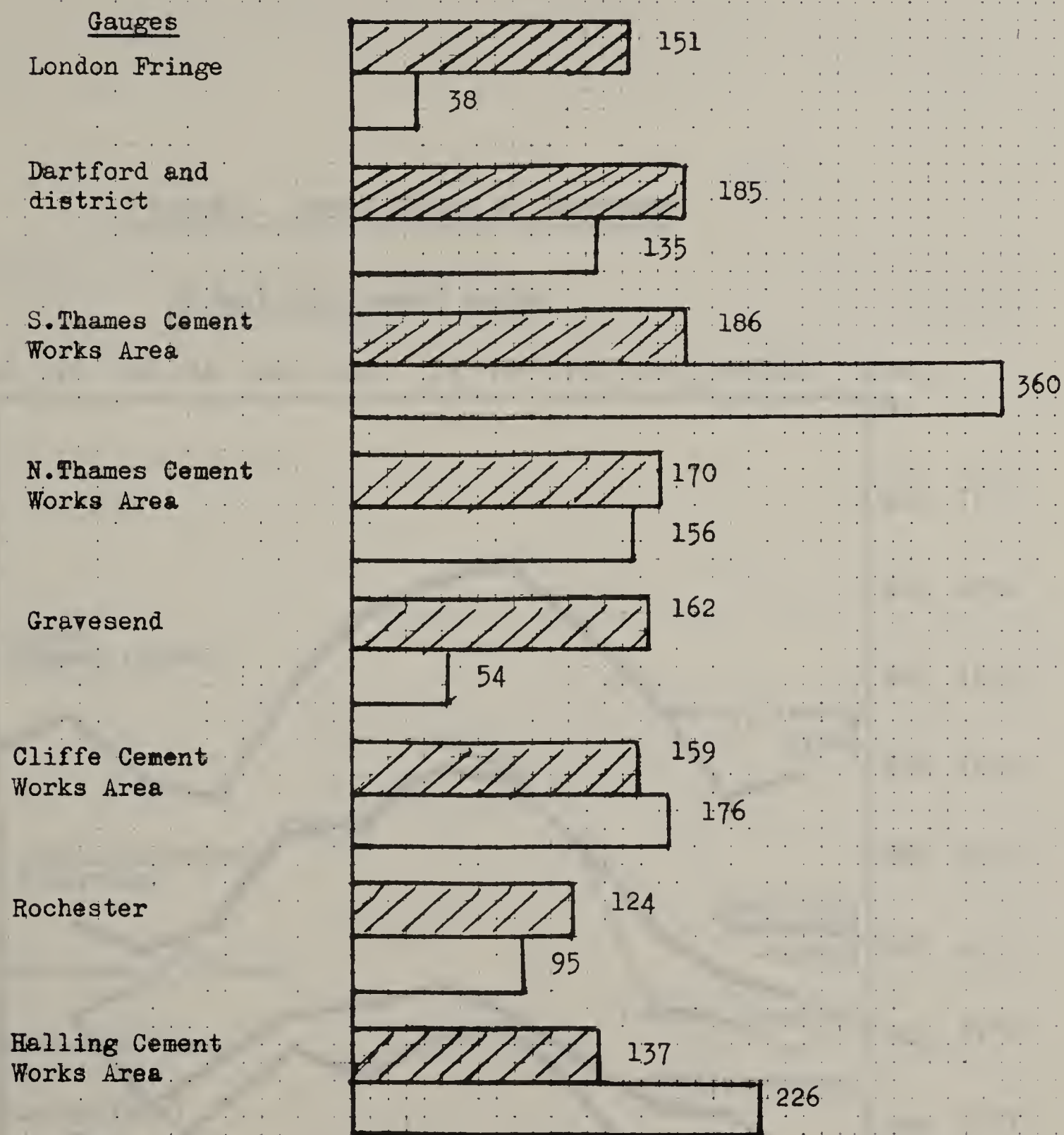


DUST FROM OTHER SOURCES

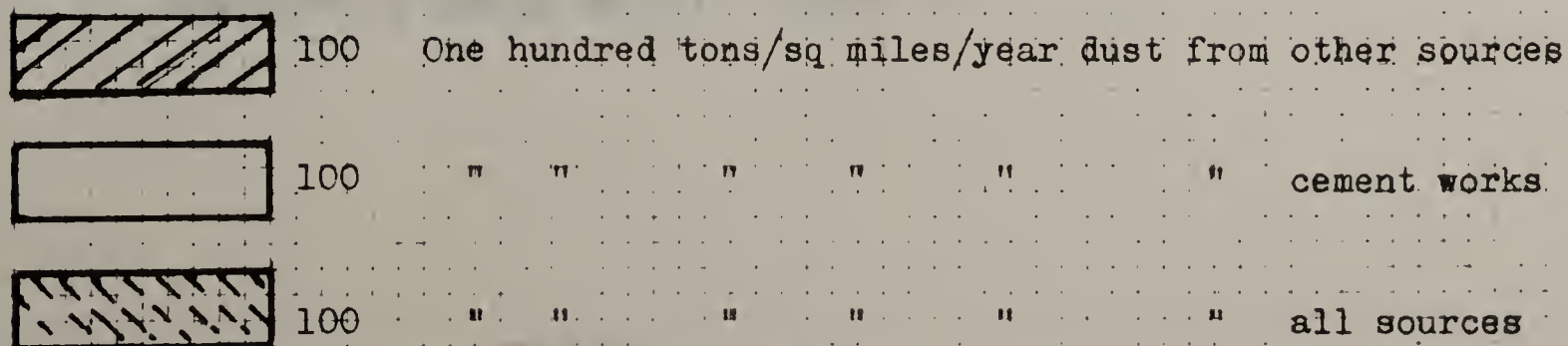
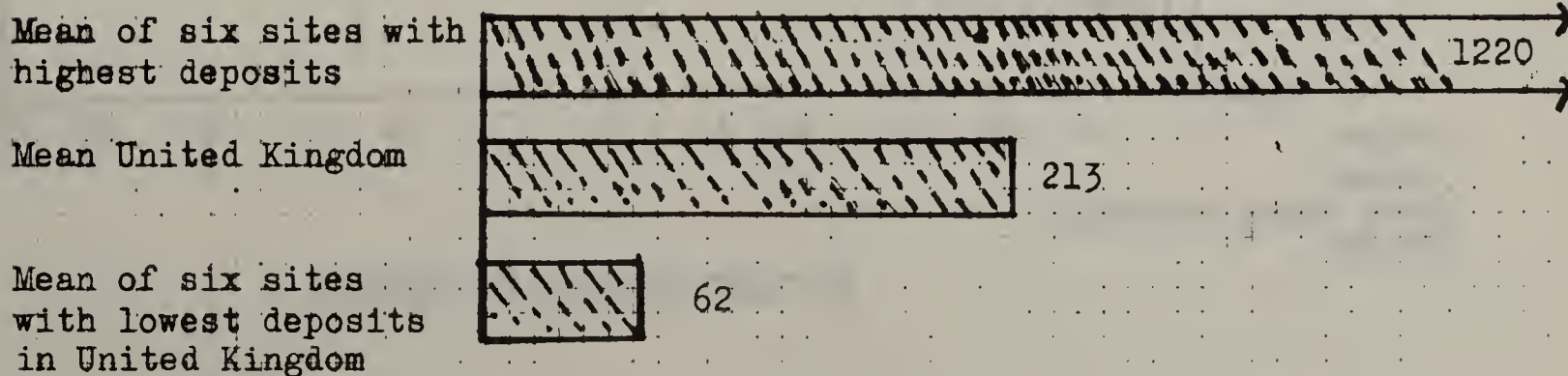


YEARLY DEPOSITS DUST TONS PER SQ.MILE Mainly 1954-69

Weighted Means of grouped gauges



United Kingdom 1956-57 (from 30th Report D.S.I.R.) Total deposits



13 GAUGES - LONDON FRINGE TO GRAVESEND



THE SIGNIFICANCE OF CHANGES IN THE AMOUNTS OF DUST DEPOSITS
STATISTICAL METHOD BY WHICH THIS HAS BEEN ESTIMATED

Let x = each individual annual deposit
 n = number of annual deposits represented by mean
 s.d. = standard deviation, s.e. = standard error
 s.e.₅, s.e.₄, s.e.₃ = s.e. of mean of 5, 4, and 3 years observations
 s.e._a and s.e._b be s.e.'s of separate means a and b.

Then:

$$s.d. = \sqrt{\frac{\sum x^2 - \frac{(\sum x)^2}{n}}{n-1}} \quad s.e. = \frac{s.d.}{\sqrt{n}}$$

s.e. for periods other than the one calculated

(i) Where periods are for the same number of years the s.e. for any period is assumed as an approximation to be the same as the one calculated.

(ii) Where the periods differ in the number of years contained

$$s.e._4 = s.e._5 \sqrt{\frac{5}{4}} = s.e._5 \times 1.1 \quad s.e._3 = s.e._5 \sqrt{\frac{5}{3}} = s.e._5 \times 1.3$$

s.e. of difference between means

$$s.e. \text{ of difference} = \sqrt{s.e._a^2 + s.e._b^2}$$

If $s.e._a = s.e._b$ it follows that s.e. of difference = $s.e._a \sqrt{2}$

The probability with which a difference between means might be produced by chance is obtained by:

- (i) dividing the difference by s.e. of difference
- (ii) applying the resultant factor to the relevant line of the "t" distribution table using the 8th line for comparison of two five year periods (5-1) + (5-1) the 6th line for a comparison of a five year period with a three year period (5-1) + (3-1)

The calculations for dust from cement works in the Northfleet gauge provide an illustration.

	x	x ²
1960	434	188400
1961	332	110200
1962	343	117600
1963	361	130300
1964	300	90000
	1770	636500

$$s.d = \sqrt{\frac{636500 - \frac{1770^2}{5}}{5-1}} = \sqrt{\frac{636500 - \frac{3133000}{5}}{4}} = \sqrt{\frac{9900}{4}} = \sqrt{2475} = 49.75$$

$$s.e._5 = \frac{49.75}{\sqrt{5}} = 22.2$$

Mean of
yearly
deposits

1955-59
280

1960-64
354

1965-67
228

s.e. for 1960-65 5 year mean i.e. 22.2 is applicable to 1955-59 5 year mean.

s.e. for 1965-67 3 year mean = $22.2 \times 1.3 = 28.8$

s.e. for difference between means of 1955-59 and 1960-64 = $22.2 \sqrt{2} = 31.4$

s.e. for difference between means of 1960-64 and 1965-67 = $\sqrt{22.2^2 + 28.8^2} = 36.4$

Difference between means of 1955-59 and 1960-64 = +74 difference ÷ s.e. diff. = $74/31.4 = 2.36$. Apply factor 2.36 to line 8 of "t" distribution table and probability of around .05 is given.

Difference between means of 1960-64 and 1965-67 = 126. Difference ÷ s.e. difference = $\frac{126}{36.4} = 3.45$. Apply factor 3.45 to line 6 of "t" distribution table and probability of around .01 is given.

Site of gauge	Period*	TOTAL DUST					
		Mean Annual deposit	Diff. from prev. period	S.E. based on last 5 year period	S.E. of diff.	Diff. $\frac{1}{2}$ by S.E. of diff.	Probability with which chance could produce the difference
SWANLEY	1961-64 (4 yrs)	161		10.9)			
	1965-69	186	+25	9.9)	14.7	1.70	.1
SIDCUP	1957-59 (3 yrs)	140		8.9)			
Black Fen	1960-64	158	+18	6.8))	11.2	1.61	.2
	1965-69	164	-14	6.8)	9.6	1.46	.2
SIDCUP	1955-59	153		7.0)			
Royal Pk	1960-64	160	+7	7.0))	9.9	0.71	.5
	1965-69	146	-14	7.0)	9.9	1.42	.2
BEXLEY	1955-59	187		8.4)			
	1960-64	172	-15	8.4))	11.9	1.26	.2
	1965-69	178	+6	8.4)	11.9	0.50	.6
ERITH	1955-59	202		6.3)			
	1960-64	199	-3	6.3))	8.9	.34	.7
	1965-69	212	+13	6.3)	8.9	1.46	.2
CRAYFORD	1955-59	253		11.2)			
	1960-64	288	+35	11.2))	15.8	2.22	<u>.05</u>
	1965-69	223	-65	11.2)	15.8	4.12	<u>.01</u>
DARTFORD	1955-59	305		11.7)			
Central	1960-64	288	-17	11.7))	16.5	1.03	.3
	1965-69	259	-29	11.7)	16.5	1.76	.1
DARTFORD	1955-59	340		18.9)			
Bow Arrow	1960-64	405	+65	18.9))	25.9	2.52	<u>.05</u>
	1965-69	369	-36	18.9)	25.9	1.39	.2
DARTFORD	1957-59 (3 yrs)	375		21.0)			
Joyce Green	1960-64	337	-38	16.1))	26.5	1.43	.2
	1965-69	302	-35	16.1)	22.8	1.54	.2
HORNS CROSS	1955-59	620		27.2)			
	1960-64	653	+33	27.2))	38.4	0.86	.4
	1965-69	628	-25	27.2)	38.4	0.65	.5
SWANSCOMBE	1955-59	564		10.0)			
	1960-64	506	-58	10.0))	14.2	4.08	<u>.01</u>
	1965-69	483	+23	10.0)	14.2	1.64	.2
NORTHFLEET	1955-59	507		43.7)			
	1960-64	484	-23	43.7))	61.9	0.37	.7
	1965-69	423	+61	56.9)	71.8	0.85	.4
THURROCK	1955-59	357		9.8)			
Ward Ave.	1960-64	318	-39	9.8))	13.9	2.80	<u>.02</u>
	1965-69	349	+31	9.8)	13.9	2.23	<u>.05</u>
GRAVESEND	1957-59 (3 yrs)	230		22.4)			
Dashwood	1960-64	197	-33	17.2))	28.2	1.17	.3
	1965-59	223	+26	17.2)	24.4	1.06	.3
GRAVESEND	1957-59 (3 yrs)	224		4.6)			
Swimming	1960-64	215	-9	3.6))	5.8	1.60	.2
Pool	1965-69	212	-3	3.6)	5.1	0.58	.6

L X X V

TOTAL DUST (continued)

Site of gauge	Period*	Mean Annual deposit	Diff. from prev. period	S.E. based on last 5 year period	S.E. of diff.	Diff. by S.E. of diff.	Probability with which chance could produce the difference
CLIFFE	1957-59 (3yrs)	292		7.3)			
	1960-64	363	+71	5.6))	9.2	7.74	<u>.001</u>
	1965-69	355	- 8	5.6)	7.9	1.14	<u>.3</u>
STROOD CEMETERY	1957-59(3 yrs)	219		12.7)			
	1960-64	218	- 1	9.8))	16.0	0.06	.9
	1965-69	220	+ 2	9.8)	13.9	0.14	.9
FORT PITT	1957-59(3 yrs)	199		9.5)			
	1960-64	189	-10	7.3))	12.0	0.83	.4
	1965-69	185	- 4	7.3)	10.5	0.39	.7
FRINDSBURY	1957-59(3 yrs)	220		24.1)			
	1960-64	214	- 6	18.8))	30.6	0.20	.8
	1965-69	240	+26	18.8)	26.6	0.98	.4
N.HALLING	1957-59 (3 yrs)	413		42.3)			
	1960-64	547	+34	32.5))	16.9	2.0	.1
	1965-69	480	-67	32.5)	46.0	1.5	.2

L X X V

DUST FROM CEMENT WORKS

SWANLEY	1961-64 (4 yrs)	39		6.7)			
	1964-65	25	-14	6.0)	9.0	1.56	.2
SIDCUP Black Fen	1957-59 (3 yrs)	23		5.6)			
	1960-64	36	+13	4.3))	7.1	1.86	.1
	1965-69	15	-21	4.3)	6.1	3.45	<u>.01</u>
SIDCUP Royal Pk	1955-59	27		6.2)	8.8	1.84	.1
	1960-64	43	+16	6.2))	8.8	2.16	<u>.05</u>
	1965-69	24	-19	6.2)			
BEXLEY	1955-59	28		4.0)			
	1960-64	42	+14	4.0))	5.7	2.46	<u>.05</u>
	1965-69	28	-18	4.0)	5.7	3.16	<u>.02</u>
ERITH	1955-59	38		3.4)			
	1960-64	46	+ 8	3.4))	4.8	1.67	.1
	1965-69	27	-19	3.4)	4.8	3.96	<u>.01</u>
CRAYFORD	1955-59	51		18.4)			
	1960-64	99	+48	18.4))	26.0	1.84	.1
	1965-69	48	-51	18.4)	26.0	1.96	.1
DARTFORD Central	1955-59	94		10.3)			
	1960-64	146	+52	10.3))	14.6	3.56	<u>.01</u>
	1965-59	86	-60	10.3)	14.6	4.11	<u>.01</u>
DARTFORD Bow Arrow	1955-59	148		16.9)			
	1960-64	267	+119	16.9))	24.0	4.96	<u>.001</u>
	1965-69	143	-124	16.9)	24.0	5.18	<u>.001</u>
DARTFORD Joyce Green	1957-59 (3 yrs)	118		9.7)			
	1960-64	155	+37	7.5))	12.3	3.01	<u>.02</u>
	1965-69	80	-75	7.5)	12.3	6.10	<u>.001</u>

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DUST FROM CEMENT WORKS (continued)

Site of gauge	Period*	Mean annual deposit	Diff. from prev. period	S.E. based on last 5 year period	S.E. of diff.	Diff. \pm by S.E. of diff.	Probability with which chance could produce the difference
HORNS CROSS	1955-59	413		24.5)			
	1960-64	517	+ 104	24.5))	34.5	3.02	<u>.02</u>
	1965-69	401	- 116	24.5)	34.5	3.36	<u>.01</u>
SWANSCOMBE	1955-59	322		8.7)			
	1960-64	379	+ 57	8.7))	12.3	4.62	<u>.01</u>
	1965-69	295	- 84	8.7)	12.3	6.80	<u>.001</u>
NORHTFLEET	1955-59	280		22.2)			
	1960-64	354	+ 74	22.2))	31.4	2.36	<u>.05</u>
	1965-67 (3 yrs)	228	- 126	28.8)	36.4	3.45	<u>.01</u>
THURROCK Ward Ave.	1955-59	165		11.8)			
	1960-64	202	+ 37	11.8))	16.7	2.21	<u>.05</u>
	1965-69	179	- 23	11.8)	16.7	1.38	<u>.2</u>
GRAVESEND Dashwood	1957-59 (3 yrs)	59		1.7)			
	1960-64	66	+ 7	1.3))	2.14	3.27	<u>.02</u>
	1965-69	38	- 28	1.3)	1.84	15.4	<u>.001</u>
GRAVESEND Swimming Pool	1957-59 (3 yrs)	61		5.5)			
	1960-64	65	+ 4	4.2))	6.86	5.82	<u>.001</u>
	1965-69	37	- 28	4.2)	6.0	4.70	<u>.001</u>
CLIFFE	1957-59 (3 yrs)	122		65.5)			
	1960-64	191	+ 69	50.5))	82.7	.83	.4
	1965-69	191	--	50.5)	71.5	0.00	1.0
STROOD CEMETERY	1957-59 (3 yrs)	95		13.1)			
	1960-64	116	+ 21	10.1))	16.5	1.27	.3
	1965-69	105	- 11	10.1)	14.3	.77	.5
FOR PITT	1957-59 (3 yrs)	73		6.1)			
	1960-64	77	+ 4	4.7))	7.70	.52	.6
	1965-69	56	- 21	4.7)	6.65	3.15	<u>.02</u>
FRINDSBURY	1957-59 (3 yrs)	76		22.1)			
	1960-64	92	+ 16	17.0))	27.9	.57	.6
	1965-69	108	+ 16	17.0)	24.1	.66	.5
N. HALLING	1957-59 (3 yrs)	292		31.8)			
	1960-64	425	+ 133	24.5))	40.1	3.31	<u>.02</u>
	1965-69	295	-130	24.5)	33.6	3.87	<u>.01</u>

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DUST FROM OTHER SOURCES

SWANLEY	1961-64 (4 yrs)	122		12.5)			
	1965-59	161	+ 39	11.3))	16.9	2.3	<u>.05</u>
SIDCUP Black Fen	1957-59 (3 yrs)	116		7.4)			
	1960-64	121	+ 5	5.7))	9.3	0.54	<u>.06</u>
	1965-69	148	+ 27	5.7)	8.1	3.33	<u>.02</u>

LXXVI

DUST FROM OTHER SOURCES (continued)

Site of gauge	Period*	Mean annual deposit	Diff. from prev. period	S.E. based on last 5 year period	S.E. of diff.	Diff \div by S.E. of diff.	Probability with which chance could produce the difference
SIDCUP	1955-59	125		6.8)			
Royal Pk	1960-64	117	- 8	6.8))	9.6	0.83	.4
	1965-69	121	+ 4	6.8)	9.6	0.42	.7
BEXLEY	1955-59	158		5.2)			
	1960-64	129	- 29	5.2))	7.4	3.94	<u>.01</u>
	1965-69	150	+ 21	5.2)	7.4	2.85	<u>.05</u>
ERITH	1955-59	164		7.3)			
	1960-64	153	- 11	7.3))	10.4	1.05	.3
	1965-69	184	+ 31	7.3)	10.4	2.97	<u>.05</u>
CRAYFORD	1955-59	201		5.6)			
	1960-64	189	- 12	5.6))	7.9	1.52	.2
	1965-69	176	- 13	5.6)	7.9	1.64	.2
DARTFORD	1955-59	210		3.7)			
Central	1960-64	142	- 68	3.7))	5.3	12.95	<u>.001</u>
	1965-69	173	+ 31	3.7)	5.3	5.90	<u>.001</u>
DARTFORD	1955-59	192		15.5)			
Bow Arrow	1960-64	138	- 54	15.5))	22.0	2.46	<u>.05</u>
	1965-69	225	+ 87	15.5)	22.0	3.96	<u>.01</u>
DARTFORD	1957-59 (3 yrs)	257		21.5)			
Joyce Green	1960-64	182	- 75	16.5))	27.1	2.78	<u>.05</u>
	1965-69	219	+ 37	16.5)	23.4	1.58	.2
HORNS CROSS	1955-59	207		26.8)			
	1960-64	136	- 71	26.8))	37.8	1.88	.1
	1965-69	227	+ 91	26.8)	37.8	2.41	<u>.05</u>
SWANSCOMBE	1955-59	241		8.0)			
	1960-64	126	-115	8.0))	11.3	10.2	<u>.001</u>
	1965-69	188	+ 62	8.0)	11.3	5.3	<u>.001</u>
NORTHFLEET	1955-59	226		25.4)			
	1960-64	130	- 96	25.4))	35.9	2.68	<u>.05</u>
	1965-67 (3 yrs)	195	+ 65	25.4)	41.7	1.56	.2
THURROCK	1955-59	182		12.0)			
Ward Ave.	1960-64	116	- 66	12.0))	17.0	3.8	<u>.01</u>
	1965-69	170	+ 54	12.0)	17.0	3.2	<u>.02</u>
GRAVESEND	1957-59 (3 yrs)	171		24.3)			
Dashwood	1960-64	130		18.7))	30.7	1.3	.2
	1965-69	184	+ 54	18.7)	26.5	2.0	.1
GRAVESEND	1957-59 (3 yrs)	163		7.6)			
Swimming	1960-64	150	- 13	6.0))	9.8	1.3	.2
Pool	1965-69	175	+ 25	6.0)	8.5	2.9	<u>.05</u>
CLIFFE	1957-59 (3 yrs)	169		13.9)			
	1960-64	148	- 21	10.7))	17.5	1.2	.3
	1965-69	163	+ 15	10.7)	13.9	1.1	.3

LXXXVI DUST FROM OTHER SOURCES (continued)

Site of gauge	Period*	Mean annual deposit	Diff. from prev. period	S.E. based on last 5 year period	S.E. of diff.	Diff. $\frac{c}{i}$ by S.E. of diff.	Probability with which chance could produce the difference
STROOD CEMETERY	1957-59 (3 yrs)	124		5.9)			
	1960-64	102	- 22	4.5))	7.3	3.0	<u>.02</u>
	1965-69	125	+ 23	4.5)	6.4	3.6	<u>.02</u>
FORT PITT	1957-59 (3 yrs)	122		13.5)			
	1960-64	111	- 11	10.4))	17.0	0.7	.5
	1965-69	129	+ 18	10.4)	14.7	1.2	.3
FRINDSBURY	1957-59 (3 yrs)	144		5.3)			
	1960-64	122	- 22	4.1))	6.7	3.3	<u>.02</u>
	1965-69	131	+ 9	4.1)	5.3	1.7	<u>.2</u>
N. HALLING	1957-59 (3 yrs)	120		15.4)			
	1960-64	122	+ 2	11.9))	19.6	0.1	.9
	1965-69	185	+ 65	11.9)	16.8	3.8	<u>.01</u>

SUMMATED READINGS OF GROUPS OF GAUGES

Sites of gauges in group	Period	Mean annual summated reading	Diff. from prev. period	S.E. based on last 5 year period	S.E. of diff.	Diff. by S.E. of diff.	Probability for chance to produce difference
<u>TOTAL DUST</u>							
SIDCUP(2)	) 1957-59(3 yrs)	922		36.6)	46.3	1.15	.3
BEXLEY, ERITH)	1960-64	975	+ 53	28.3))			
CRAYFORD	) 1965-69	923	- 52	28.3)	40.0	1.30	.2
DARTFORD Ce	) 1957-59(3 yrs)	1006		52.0)			
DARTFORD B.A)	1960-64	1031	+ 25	44.0))	68.1	0.36	.7
DARTFORD J.C)	1965-69	931	-100	44.0)	62.2	1.61	.2
HORNS CROSS	) 1955-59	1690		82.0)			
SWANCOMBE	) 1960-64	1643	- 47	82.0))	115.8	0.41	.7
NORTHFLEET	) 1965-67 (3 yrs)	1191	-452	106.6)	134.5	3.37	.02
GRAVESEND	) 1957-59(3 yrs)	455		23.3)			
Dashwood &	) 1960-64	412	- 43	17.9))	29.4	1.47	.2
S.Pool	) 1965-69	435	+ 23	17.9)	25.3	0.91	.4
STROOD CEM	) 1957-59(3 yrs)	639		66.3)			
FORT PITT	) 1960-64	622	- 17	51.0))	83.7	0.20	.8
FRINDSBURY	) 1965-69	725	+103	51.0)	72.0	1.43	.2
<u>DUST FROM CEMENT WORKS</u>							
SIDCUP (2)	) 1957-59(3 yrs)	171		36.8)			
BEXLEY, ERITH)	1960-64	268	+ 97	28.3))	46.4	2.10	.1
CRAYFORD	) 1965-69	143	-125	28.3)	40.1	3.12	.01
DARTFORD Ce	) 1957-59(3 yrs)	365		41.2)			
DARTFORD B.A)	1960-64	568	+203	31.7))	51.9	3.92	.01
DARTFORD J.C)	1965-69	311	-257	31.7)	45.0	5.72	.001
HORNS CROSS	) 1955-59	1016		48.4)			
SWANSCOMBE	) 1960-64	1250	+234	48.4))	68.4	3.43	.01
NORTHFLEET	) 1965-67	922	-328	62.3)	78.9	4.17	.01
GRAVESEND	) 1957-59(3 yrs)	120		6.85)			
Dashwood &	) 1960-64	131	+ 11	5.26))	8.64	1.28	.3
S.Pool	) 1965-69	75	- 56	5.26)	7.45	7.52	.001
FRINDSBURY	) 1957-59(3 yrs)	248		39.4)			
STROOD	) 1960-64	287	+ 39	30.3))	49.7	0.79	.5
FORT PITT	) 1965-69	270	- 17	30.3)	44.7	0.38	.7
<u>DUST FROM SOURCES OTHER THAN CEMENT WORKS</u>							
SIDCUP (2)	) 1957-59(3 yrs)	750		20.5)			
BEXLEY, ERITH)	1960-64	710	- 40	15.8))	25.9	1.55	.2
CRAYFORD	) 1965-69	779	+ 69	15.8)	22.3	3.09	.02
DARTFORD CEN)	1957-59(3 yrs)	641		40.6)			
DARTFORD B.A)	1960-64	463	-178	31.3))	51.3	3.47	.01
DARTFORD J.C)	1965-69	620	+157	31.3)	44.1	3.55	.01
HORNS CROSS	) 1955-59	674		58.2)			
SWANSCOMBE	) 1960-64	392	-282	58.2))	82.3	3.43	.01
NORTHFLEET	) 1965-67(3 yrs)	602	+210	75.7)	95.5	2.20	.05
GRAVESEND	) 1957-59(3 yrs)	334		26.4)			
Dashwood &	) 1960-64	280	- 54	20.3))	33.3	1.64	.2
S.Pool	) 1965-69	360	+ 80	20.3)	28.8	2.79	.02
STROOD CEM	) 1957-59(3 yrs)	391		18.6)			
FORT PITT	) 1960-64	335	- 56	14.4))	23.6	2.38	.05
FRINDSBURY	) 1965-69	375	+ 40	14.4)	20.3	1.97	.1

